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No. 1210



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## INTERNATIONAL ECONOMIC RELATIONS

### OBSTACLES TO DEVELOPMENT OF TRADE WITH UNITED STATES ELUCIDATED

Moscow SOVETSKAYA ROSSIYA in Russian 9 Sep 79 p 3

[Letter to editors from N. Galiulin and response by Nikolay Vasil'yevich Zinov'yev, chief of the Administration for Trade with America and Latin America of the USSR Ministry of Foreign Trade: "On Trade with the United States"]

[Text] We often hear that great possibilities exist for the development of trade between our country and the United States. American industrialists who come to the USSR almost always advocate the expansion of trade relations. What is keeping this from becoming a reality?

N. Galiulin,  
Sterlitamak, Bashkir ASSR

At the request of the editors, this reader's letter is being answered by N. V. Zinov'yev, chief of the Administration for Trade with America and Latin America of the USSR Ministry of Foreign Trade.

The tremendous economic potential of the Soviet Union and the United States of America and, consequently, the great possibilities for commercial cooperation are naturally giving rise to heightened interest in problems in Soviet-American trade. Many articles dealing with this subject have already appeared in the press, but since questions of this kind arise, it would apparently be wise to elucidate the current situation in greater detail.

It should first be noted that Soviet-American trade relations have undergone noticeable changes in the last few years. The discussion of questions connected with mutual trade at summit-level meetings of Soviet and U.S. leaders in 1972-1974 had a positive effect on its development. It was precisely at this time that an agreement was reached in regard to the establishment of a legal contractual basis, the creation of an organizational mechanism and the resolution of several other problems that had previously impeded the growth of trade between the two countries.



If we look at statistics, we find that commodity turnover between the USSR and the United States increased more than 14-fold between 1971 and 1978 and has now reached the level of 2 billion rubles a year. The growth of trade between our countries, however, has not been uniform or balanced. For example, in some years--in 1974 and 1977--the commodity turnover level fell as much as 30-35 percent, and the United States moved from second place to sixth among the industrially developed capitalist countries with which the USSR maintains commercial relations.

What are the reasons for the instability of Soviet-American trade? There are several reasons, but the main one, which is having the greatest influence, is without question the problem of the normalization of trade relations. We know that commercial credit legislation which discriminates against the USSR has been passed in the United States ever since January 1975 as a result of the efforts of those who oppose detente in Soviet-American relations. In accordance with this legislation, the USSR is not given most-favored-nation status in its export of goods to the United States, and the Soviet side has essentially been denied the opportunity of making use of government credit extended through the Export-Import Bank of the United States. We should note in passing that this is the very bank that was once founded expressly for the purpose of financing Soviet-American trade.

Besides this, several other laws and statutes which set up various obstacles to trade with our country are still in force in the United States. In particular, we could mention a law passed in 1951, during the cold war, which prohibits U.S. imports of seven types of Soviet furs.

The purpose of all these restrictions is completely self-evident. They are being used in the pursuit of an absolutely definite and unscrupulous goal--the utilization of trade for the attainment of specific political objectives. It is completely obvious that this kind of policy is a hopeless cause in relations with the Soviet Union. Our nation has always based its foreign trade on the principle of mutually beneficial terms, excluding any kind of political provisos.

The discriminatory restrictions on trade are not only complicating political relations, but are also damaging economic cooperation. They are presently one of the main reasons for the unstable and uneven development of Soviet-American trade. The effects of these restrictions and, in particular, the refusal of the United States to extend the most-favored-nation principle to trade with the USSR are considerably impeding the equalization of total commodity shipments from one country to another, and they are even impeding the reduction of this disparity. The balance of Soviet-American trade is now constantly in favor of the United States, and this fact alone is naturally not conducive to the development of commodity exchange.

After all, it is impossible to purchase goods without simultaneously selling one's own products. This is the irrefutable law of trade. Current restrictions make it inconvenient for American firms to buy several Soviet products

which might find a market in the United States, and inconvenient for Soviet foreign trade organizations to sell them to the United States. These include various types of metal-cutting tools, forging, pressing and welding equipment and many other commodities.

The absence of normal trade conditions is preventing the expansion of the trade structure as well as the growth of trade volume. The assortment of Soviet exports to the United States is now limited essentially to low-duty or duty-free goods. This makes it impossible to cooperate with American firms in such progressive forms of trade as compensatory transactions because considerable difficulties arise in the specification of the goods to be delivered for compensation purposes.

Naturally, it would be naive to believe that the granting of most-favored-nation status would automatically lead to dramatic growth in the trade between the two countries. It could, however, substantially improve the economic and political climate and create the necessary conditions for the development of trade relations. All of this must be taken into consideration.

The opinion that Soviet-American trade must be normalized has recently begun to take increasingly firm hold even in the United States itself. Apparently, the deterioration of the United States' economic status and the related weakening of its positions in the world, the declining exchange rate of the dollar, the huge deficit in the U.S. balance of trade and other problems of an economic and political nature are motivating Americans with a realistic outlook to reassess their views on the normalization of trade relations with the USSR as well. This is attested to, in particular, by the bills submitted to Congress at the beginning of this year by Senator A. Stevenson and Congressman L. AuCoin, proposing changes in current U.S. commercial credit laws.

There is obviously no need to discuss the content of these bills now, since they are still in the discussion stage. I would just like to say that this is essentially the first step taken by the U.S. Congress toward any kind of normalization of Soviet-U.S. trade since the time when the commercial credit laws of 1974 were passed.

The idea that the normal development of bilateral trade will only be possible after the improvement of political relations is quite frequently expressed in the American press. It is quite obvious that it is much easier to develop mutual trade when political relations between countries are normal, but something else must also be considered--strong trade and economic ties can sometimes aid in taking the edge off political problems that arise in bilateral relations.

Questions connected with Soviet-American trade were discussed at the recent Vienna meeting of General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet L. I. Brezhnev and U.S. President J. Carter, which evoked widespread positive response throughout



the world. A joint communique, signed at the end of the talks, underscored the great significance of cooperation between the USSR and the United States on the basis of mutual advantage in accordance with existing agreements between the two countries. In particular, the fact that economic and trade relations represent an important element in the development and improvement of bilateral contacts was reaffirmed. Both sides expressed approval of the reinforcement of these relations and recognized the need to eliminate the obstacles that are now restricting the development of mutually beneficial financial ties. The two sides expressed their determination to encourage the appropriate organizations and institutions in their countries to conclude mutually beneficial commercial agreements and contracts on a long-term basis. There is no doubt that practical steps in the directions specified in the communique will benefit both the Soviet and the American people.

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## EXPERIMENTAL PLANNING SYSTEM TESTED IN MINISTRY

Yerevan KOMMUNIST in Russian 13 Sep 79 p 2

[Interview with Deputy Minister, Ministry of Instrument Building, Automation, and Control Systems, K.B. Arutyunov: "Cost-accounting The Center of An Experiment"]

[Text] A complex of programs which are to be implemented in the near-term for further improvement of management, planning, and organizational methods, envisaged in the recently published decree of the CPSU Central Committee and the USSR Council of Ministers, was developed with consideration given major economic experiments which have been conducted in our country. One of those experiments was the conversion of an entire sector--the Ministry of Instrument Building, Automation Equipment and Control Systems [Minpribor] to cost-accounting principles of management, planning, and financing.

A TASS correspondent asked Deputy Minister, K.B. Arutyunov, to describe what opportunities exist for accelerating the development of the sector through this system, and what ways it may be developed further.

What essentially, is the system of management, planning, and financing to which the sector converted almost 10 years ago?

The primary planning for the production-management operations of the sector is the five-year plan with tasks distributed by year. In the annual plans, specific indicators envisaged in the tasks of the five-year plan may be defined more specifically. Here they must not be lower than previously planned with the availability of the necessary material resources. Here, particularly the foundation is provided by the principle advanced by the CPSU Central Committee and USSR Council of Ministers Decree for stimulation of labor collective initiative to accept intensified plans, their orientation toward the search for methods and means to increase the efficiency of production.

The sector was given the right to increase during the course of the year plans for production sales and profits. The latter is distributed proportionally between the State Budget and the Ministry.

In accordance with the five-year plan, long term economic allowances are certified for the ministry, standard computations from profits within the sector and the general wage fund. Expenditures made by the sector for expanded reproduction are fully compensated through its own sources. In other words, Minpribor operates without receiving budget allocations, according to the principle of planned self-financing.

Such broad rights entail a commensurate full measure of responsibility. In the event of plan non-fulfillment in the area of profit, payments are made in prescribed amounts from sector financial resources by reducing planned expenditures. However, we hasten to state: Minpribor did not have to resort to this measure. In this instance, the principle of "interest" on the part of all elements in the final results--one of the basic positions of the decree, "functioned" reliably.

To achieve stable, high operational results, apparently a system to improve management of the sector was needed?

During the course of the experiment, such programs were developed. Relying upon those programs, the sector coped with the task of the five-year plan even though not all resources, particularly capital investment funds were allocated to the ministry in the amounts envisioned by the five-year plan.

A qualitatively novel approach was needed toward organizing the management of associations, enterprises, and organizations. Specifically, with the introduction of the sector cost-accounting system in the ministry, the automated sector management system (ASU-Instrument) underwent development, which provides for effective daily control over all operations of every element in the sector production complex. This is particularly important under planned self-financing operating conditions.

What, generally speaking, are the positive results of the sector's operation based upon the new principles of management, planning, and financing?

The Ministry successfully met the tasks of the past five-year plan. The volume of production rose by a factor of 2.2 and the productivity of labor by a factor of 1.8, and return on investment increased by 23 percent. The sector is operating in a stable manner in the current five-year plan. An outstripping growth has been attained in the volume of production, in labor productivity and in profits.

A fuller utilization of management mechanism levers has positively affected the improvement of production, and during the five-year plan, approximately 60 percent of our items are being upgraded.

The proportion of total production warranting the highest category of quality significantly rose--from 8.5 percent in 1975 to 35.1 percent last year. Within the sector, the number of enterprises failing to fulfill basic plan tasks was sharply reduced.

Are the advantages of the program to improve the sector's operations being fully utilized?

Unfortunately, no. The results might have been higher. However, changing the principles of planning within a single sector was found to be a difficult matter in actual practice. This is why the instrument builders accepted with deep approval the decree of the party Central Committee and the USSR Council of Ministers which envisages an improvement in planning and a strengthening of the effect of the management mechanism upon increasing the efficiency of production and the quality of operations on a national economic scale overall.

Practice confirms that the realization of the decree provisions must be immediately addressed. The experience gained by a number of sectors in the struggle to improve the efficiency and quality of operations is an excellent basis for the further improvement of management for the country's economy.

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## CONSUMER GOODS AND DOMESTIC TRADE

### CAR SALES BY MILITARY TRADE ENTERPRISES

Moscow KRASNAYA ZVEZDA in Russian 13 Sep 79 p 4

[Interview at readers' request with Deputy Chief, Main Trade Directorate, USSR Ministry of Defense, Gen Maj, Quartermaster Service, V. Bondarenko, KRASNAYA ZVEZDA readers S. Govorukha, A. Tomin, and others ask that the procedure for selling automobiles through military trade enterprises be explained. Gen Maj V. Bondarenko responds to their question]

[Text] As the result of the concern of the Communist Party and the Soviet government for the welfare of the people our standard of living for workers improves each year, incomes increase, and consequently, the solvent demands of the population increase as well. This particularly is convincing borne out by the increased demand for such durable goods as automobiles. From year to year the number of autos sold increases. For example, just within military trade channels, the sale of autos over a recent period has increased by a factor of 13.

Nevertheless, providing personal transportation for all those wishing it is still not possible. Therefore, the proper organization of motor vehicles trade has great significance, including through the Main Trade Directorate of the USSR Ministry of Defense. For these purposes, a definite procedure has been established for the sale of autos. In accordance with this procedure, purchase of an auto through specialized stores of the military trade system is available to: Heroes of the Soviet Union and individuals awarded orders of Glory, three degrees; generals, admirals, officers, warrant officers (army and navy), career servicemen and female service personnel on active duty in the Soviet Army and Navy, and also in border and internal forces; generals, admirals, officers, warrant officers and career service personnel in reserve or retired, if they served in the armed forces no less than 25 years; workers and office employees of the Soviet Army and Navy; generals, officers, warrant



officers, warrant officers, workers and office workers of the USSR Ministry of Internal Affairs and the USSR KGB (Committee for State Security), and their republican, kray, and oblast organizations.

Reports and announcements of wish to purchase are issued in the name of the unit commander or the military registration office (voenkomat) by residence (for individuals who are members of the reserve or are retired).

The units or voenkوماتs, based upon the reports or declaration of wish to purchase an automobile, at the beginning of each year formulate a list of purchasers. This work must involve representatives of political organizations, party organizations, and the public. First priority for the list is afforded participants in the Great Patriotic War, army and navy veterans, outstanding military and political trainees, active public figures, and winners of socialist competition.

It is apparent that a number of mis-understandings which have arisen must be explained, those mis-understandings arising in the course of formulating the lists and their subsequent implementation. For example, individuals with 25 years of service in the armed forces for preference computation of course have the right to purchase an auto in the military trade system stores. Those individuals also have the right who have not yet obtained a garage or a driver's license.

There are certain complications with the purchase of an auto by individuals serving or working outside the territory of the USSR. They make the purchase upon return to the Homeland at any, but previously indicated enterprise of the military trade system. Incidentally, it is necessary to avoid subsequent re-addressing, as the delivery is centrally planned for military trade and the fulfilling of such a request is not always possible.

Within the trade rules, there is no prohibition against a repeat purchase of an automobile. To avoid abuse here the active involvement of the public is required. Its participation and also the broad publicity given the procedure are required in the resolution of problems regarding exclusion of individuals for the purchaser lists. The decision of the commander, in accordance with the cited instructions, must be made available to the purchasers excluded from the list in official procedure. It is forbidden to exclude any individual who has departed for a new service assignment.

The automobile must be sold within the period indicated in the list of purchasers, but no later than one year from the time the commander signs and 60 days after payment is received. The buyer

must inform the store of his inability to appear for purchase within the period designated by the store. In the absence of legitimate reasons, the purchaser is excluded from the list in 30 days.

The automobile is sold only after its pre-sale preparation, which is noted in the service booklet. Sale of autos without the full range of equipment or in damaged condition is forbidden. Claims for failure of parts, sub-assemblies or assemblies during the warranty period are reviewed at warranty points of the manufacturing plants.

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## CONSUMER GOODS AND DOMESTIC TRADE

### DEVELOPMENT OF KOLKHOZ MARKETS

Moscow SOVETSKAYA TORGOVLYA in Russian 11 Aug 79 p 1

[Text] Today, almost 6,000 kolkhoz markets are operating in our country, with goods turnover last year amounting to 6.2 billion rubles, including 5.8 billion rubles worth of foodstuffs. According to data provided by the USSR Central Statistical Administration (TsSU), the share of kolkhoz trade in the total volume of food products sold is now about 9 percent.

Dnepropetrovsk, Yaroslavl', Moscow, Tashkent, Taganrog, Kuybyshev, and a number of other cities are widely known for the abundance found in the kolkhoz markets. Here, a great deal of attention is focussed upon the transportation of agricultural products, attracting kolkhozes, sovkhoses, and other farming organizations to the markets to engage in trade, and to create maximum convenience for those engaging in trade there.

The experience of the Alaysk market in Tashkent is noteworthy. Every year, the market concludes agreements with neighboring kolkhozes, grants them a space for trading, and provides warehousing areas, and cold storage facilities. Exact provisions are made in each agreement regarding quantities and delivery dates for goods brought to market. Agreements are being successfully carried out between suburban kolkhozes and the New Market in Odessa, where each organization has its own "company" pavilion.

The experience of the Yaroslavl' Oblast Executive Committee in market management warrants the closest of attention. Here, the sale of meat, milk, fruits, vegetables, and potatoes at kolkhoz markets is increasing annually. The principal amount of produce is sold under agreements concluded by the market with the kolkhoz workers. This year, approximately 1,500 such agreements were concluded. In the oblast, 44 collection points have been established, where the kolkhoz workers bring the produce from their private plots for transportation to the market.

upon the level of organization work in the oblast and municipal administrations for kolkhoz markets, and in the administrations of the markets themselves. In those areas where the market is left to its natural impetus, where it is considered that if the kolkhoz worker has something to sell, he will come to the market of his own accord, market shops are empty. This is graphically evident if one visits the markets in the Mariyskaya and Mordovskaya ASSR's, several markets of raycenters in the Moscow and Gor'kiy oblasts, and in a number of other cities in the Russian Federation. Such an effect accrues hardly because the private plot of the kolhoz worker, of the worker settlement resident, or of a rayon center has begun producing fewer berries, fruits, and vegetables. Frequently it occurs because the individual desiring to sell part of the produce he has grown has no way of getting it to the market. If transportation can be located, there is no place to stay overnight, and no place for storing his produce. At times, the kolkhoz worker does not know whether he should go to market, or if the urban resident needs his produce, or what sort of demand exists for that produce.

One efficient method of organizing transportation is to enlist temporary or non-staff inspectors. In the Dnepropetrovsk Oblast Executive Committee Administration for Kolkhoz Markets, these employees number 400--this figure for a single administration. These are employees from settlement and rural Councils, agricultural specialists, and ordinary kolkhoz workers and sovkhoz workers. They maintain constant communication with the market administration, and are constantly aware of the demand for a given product, and current prices for produce. This information they provide their fellow-villagers, and recommend that they sell their surplus produce at the market. Through the kolkhoz governing board, they assist in providing the rural residents with transportation, and reserved accommodations are arranged at a hotel in the city.

There are, however, examples of another type, which graphically demonstrate the kolkhoz market is not receiving the requisite attention everywhere. For example, there exists no bureau of trade services for markets in the Lithuanian, Estonian, Georgian, Azerbaijan, Uzbek, and Turkmen SSR's. In a number of cities, the practice of administratively regulating market prices still occurs, which is strictly prohibited.

Cooperative and state trade must make their contributions to the development of kolkhoz trade. In Dnepropetrovsk again, the fall trade fairs have enjoyed tremendous popularity for a good number of years running, those fairs being held in the city's central market. All trade enterprises and public catering organizations of the city, and cooperatives from the entire oblast take part in the preparations for this fair.

Of course the operation of the kolkhoz markets is dependent considerably upon their material-technical base. In recent years this base has grown and consolidated. In Baku, Voronezh, Ryazan', Omsk and a number of other cities, major modern, well-equipped markets have been built which offer all conveniences for the purchase and sale of produce. In essence, they are major trade centers, where state and cooperative trade enterprises operate with kolkhoz trade. For just the RSFSR during the current five-year plan, plans are outlined for placing 40 covered markets with 12,500 trade spaces, nine hotels, and a number of other facilities into operation. However, there are serious deficiencies in the development of the material-technical base. In oblast, kray, and republican centers, many kolkhoz markets are ill-equipped, and lack the necessary warehouse or storage capacities, as well as cold-storage. The markets are insufficiently provided with stock, weight-measure equipment, and sanitary apparel. The editorial office received a letter from the city of Stakhanovo in Voroshilovgradskaya Oblast. Reader A. Tomarevskiy writes: "In order to obtain scales at our market, one must get in line at 5 o'clock in the morning". Another letter was received from Donetsk: "At the Zavodskij Market, the pavilions are unheated during winter, consequently there are very few people wishing to trade".

Meanwhile in many cities there exist the necessary resources to expand and modernize the markets. However, those resources are far from being fully utilized.

In September 1977, the CPSU Central Committee and the USSR Council of Ministers adopted the decree "Regarding Private Supplementary (subsidiary) Farms of Kolkhoz Workers, Workers, and Office Workers and Other Citizens and Collective Garden and Orchard Operations". The decree directly states that great significance is attached to the fullest utilization of private subsidiary farm plots for the production of meat, milk, eggs, potatoes, vegetables, fruits, and other agricultural produce. The kolkhoz markets must also make their contribution toward accomplishing the decisions of the party and the state.

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## SOCIOECONOMIC FORECASTING MODELS PERFECTED

Moscow EKONOMIKA I MATEMATICHESKIYE METODY in Russian No 5, Sep-Oct 79  
pp 886-901

[Article by V. Malferov, F. M. Borodkin, L. Kh. Polyak and T. A. Fagradyan (Novosibirsk): "A System of 'Production-Population' Models for the Forecasting of Rural Socioeconomic Development"]

### [Text] 1. Introductory Comments

At present, there is virtually no one who doubts that the purpose of socioeconomic forecasting does not consist in determining the numerical value of certain parameters, but in predicting the problems that will be encountered by the object. In this process, both initial information and derived indicators play a tremendous role, combining to make up the informational base of the forecast (IBF). The IBF can be formed in the most varied ways--from the resolution of linear programming problems to statistical extrapolation, from calculations based on models to expert appraisals.

One of the possible methods of creating an IBF for rural socioeconomic development is described in this article. Obviously, the appropriate system of models would be the ideal basis for this process. Work on the construction of this kind of system began several years ago at the Economics Institute and Planning and Forecasting Division of the Siberian Department of the USSR Academy of Sciences, when a comprehensive description of rural areas was obtained [1]. Here, 14 relatively independent blocks of the object were singled out: 1) social production, 2) private subsidiary farming, 3) capital construction, 4) demography, 5) education, 6) public health, 7) culture, 8) family life, 9) trade, 10) labor resources, 11) commodity and service supply and demand patterns, 12) public income, 13) settlement patterns, 14) time balance.

### 2. General Forecasting Algorithm

Each separate block is represented by a particular model, and all of the blocks are represented by the total system, which will hereafter be called the informational model (IM). The blocks are related by variables; each

essentially represents groups of initial and final variables and algorithms for converting the values of the former into the values of the latter. The initial variables can be either endogenic, which represent the final variables of other blocks, or exogenic, with the aid of which the model is controlled. The final variables make up two (overlapping) groups: final variables which serve as initial variables for other blocks, and indicators of problems--variables whose value indicates the appearance of a problem or the inadmissibility of the current trajectory.\*

Therefore, forecasting consists of the following stages.

1. A basic theory is formulated in regard to the development of the object (general goals, limits and pacing of forecast, conditions of development, controlling influences, structure of the IM).
2. With the aid of the IM, the object's reactions to controlling influences and the influence of its own past status are modeled.
3. Problems are recorded (disparities, imbalances, shortages of resources, unattainability of objectives and so forth).
4. Trajectories and related problems are assessed. After this point, three alternative directions can be taken: a) if the trajectory is inadmissible, a new theory of development is required (stage 5); b) the trajectory is admissible but the limits of the forecast have not been reached and imitation of the object's behavior continues (stage 2); c) the trajectory is admissible and the forecasting limits have been reached--the testing of the initial theory of development is completed.
5. A new theory of development is formulated (transition to stage 2).

The structure of the IM and the type of models it includes depend considerably on the general theory of development. For example, if rural areas are regarded as some kind of sectorial entity, which is mainly responsible for providing the society with agricultural products, the main block is then "Social Production" and the rest only constitute a system of limitations on the main block. If, on the other hand, the general theory of development sets forth as the main goal the achievement of the best, from a specific standpoint, system of settlement patterns, the settlement block will be the main one, while the rest will represent the means of its development. In principle, goals of this type can be set for any block or system of blocks, but the workings of blocks have not yet been researched equally and, consequently, their capacity for modeling varies. Public agriculture, demography, education, labor resources and time schedules have been studied more than the others.

\* Here, trajectory signifies a set of IM variable values arranged in order of time sequence.

A fairly precise definition of these blocks is essentially the result of a social requirement, which was set forth, in particular, in the decisions of the 25th CPSU Congress. The general theory of rural development, reflecting this requirement, contains two equivalent goals: "to ensure the continued growth and heightened stability of agricultural production" ("Materialy XXV s"yezda KPSS" [Materials of the 25th CPSU Congress], Moscow, Politizdat, 1977, p 199) and "the continued equalization of the levels of well-being and culture and the working and living conditions...of urban and rural inhabitants" (Ibid., p 216). In this dual task, the blocks mentioned above as the most thoroughly investigated ones can be regarded as the nucleus of the IM, which will be supplemented by models of other blocks as soon as they are ready.

### 3. Nucleus of Informational Model

The nucleus of the IM included the following blocks: 1) public agricultural production and capital construction; 2) demography; 3) education; 4) labor resources; 5) time balance.

Capital construction became part of the first block for various reasons. Firstly, the dynamics of agricultural production are most closely related to it by some common resources. Secondly, technical progress in agriculture is partially due to capital construction. Thirdly, this block has not been researched adequately by us from the standpoint of content and is represented in an extremely general form in the system of models. The study of capital construction is essential, and not only because of its extremely strong influence on public agricultural production. It is noted in [2] that capital investments influence migration patterns. Moreover (see [3]), a look at total capital investments in the city is enough to explain urban migration patterns (the population flow to the city and away from it). The model of rural migration patterns, however, called for the calculation of total fixed productive assets in addition to total capital expenditures in the non-production sphere. Due to the specific nature of this matter, the indicator of fixed productive assets can be ignored, but the connection between migration patterns in the "rural-urban" system, the sizes of the rural and urban populations and capital investments in the production and non-production spheres in rural areas turned out to be extremely interesting.

Table 1 presents paired coefficients of correlation (for the USSR as a whole during the 1960-1974 period) between: 1) size of urban population; 2) size of rural population; 3) size of migration flow from rural to urban areas; 4) size of migration flow from urban to rural areas; 5) capital investments in rural production sphere; 6) capital investments in rural non-production sphere; 7) difference between capital investments in production and non-production spheres.

It would seem that the growth of capital investments in the rural non-production sphere should diminish the migration flow away from rural areas, but as we can see, the flow of migrants from rural to urban areas grows with

an increase in these expenditures. The correlation between increments in capital expenditures in the non-production sphere and increments in the number of migrants leaving rural areas for the city is quite small (-0.239) and cannot be considered significant in a progression of this length. The following considerations can serve to explain this state of affairs. We know that the first to leave rural areas for the city are the younger workers who already have a specialty [4]. Increased capital investments in the production sphere lead to the increasing saturation of rural areas with machines and mechanisms. The machine operator is one of the most respected individuals in a village and his salary is one of the highest [4]. The result of this is a mass desire, at least on the part of the male half of the population, to acquire the specialty of machine operator, and its acquisition clears a pathway to the city. The only restrictive force here would be an excellent rural infrastructure, including excellent housing. It is true that capital investments in the rural non-production sphere have increased rapidly in the last 15 years (Fig. 2), but their low initial level has caused the absolute difference between productive and non-productive capital expenditures to grow. Due to this discrepancy, the opportunities and need for rural workers to acquire higher qualifications are increasing, and higher demands are consequently being made on the infrastructure. At the same time, their satisfaction can never keep up with rising requirements. As a result, the very augmentation of capital investments in the non-production sphere and the increase in this gap become a compelling force rather than a restricting one. Obviously, the situation is not identical in different parts of the nation, but there is much evidence to suggest that the situation in Siberia is no better than the national average.

Table 1

Paired Coefficients of Correlation Between Economic and Migration Indicators for 1960-1974

1	2	3	4	5	6	7
1	-0.913 1	0.967 -0.913 1	0.913 -0.942 0.980 1	0.980 -0.957 0.935 0.891 1	0.978 -0.859 0.946 0.905 0.946 1	0.957 -0.946 0.913 0.859 0.989 0.891 1

It is precisely this gap, in our opinion, that largely determines the variability of the migration flow from rural to urban areas. Between 1961 and 1974 each million in capital investments for production and non-production purposes corresponded to an average of 70 persons migrating from rural to urban areas, plus the entire annual natural population increase. Throughout the USSR as a whole, rural population dynamics (Table 3) can adequately be expressed as:

$$y_t = y_{t-1} - 70(x_{1,t-1} - x_{2,t-1}), \quad (1)$$

where  $y_t$  signifies the size of the rural population at the beginning of year  $t$ , in millions;  $x_{1,t}$  signifies capital investments in the rural production sphere in year  $t$ , billions of rubles;  $x_{2,t}$  signifies capital investments in the rural non-production sphere in year  $t$ , billions of rubles.

Equation (1) connects the "Social Production" block with the total set of all other blocks. The total structure of the IM nucleus is presented in Diagram 1, where  $a_1$  signifies the distribution of capital investments in facilities for production and non-production purposes;  $a_2$  signifies the start-up of facilities in the production sphere;  $a_3$  signifies the size of the population flow away from rural areas;  $a_4$  signifies the migration balance by sex and age groups;  $a_5$  signifies population distribution in terms of levels and types of education;  $a_6$  signifies the contingent of students in secondary academic institutions located in rural areas;  $a_7$  signifies the population group of working age;  $a_8$  signifies rural population distribution in terms of educational groups;  $a_9$  signifies the distribution of the working-age population in terms of qualification categories;  $a_{10}$  signifies the amount of working time of individual qualification categories which can be used in public agricultural production;  $\beta_1$  signifies the total set of exogenic restrictions and special coefficients;  $\beta_2$  signifies the general limit on capital investments;  $\beta_3$  signifies the migration coefficients of sex and age groups with consideration for education;  $\beta_4$  signifies coefficients of birth and mortality rates;  $\beta_5$  signifies coefficients of population mobility in terms of educational levels and types of academic institutions;  $\beta_6$  signifies special coefficients distinguishing the working-age population;  $\beta_7$  signifies time balances in various types of settlements and the distribution of the latter by types;  $\gamma_1$  signifies agricultural production; the estimated scarcity of various limited resources; the number of vacant jobs in different branches of agricultural production, construction and the non-production sphere for different qualification categories;  $\gamma_2$  signifies coefficients of workload for different qualification categories and types of settlements; the structure of leisure time in various qualification categories and types of settlements for a particular segment of the labor force;  $\gamma_3$  signifies the balance of labor resources and the level of employment;  $\gamma_4$  signifies population size in terms of sex and age groups;  $\gamma_5$  signifies population distribution in terms of educational levels;  $\gamma_6$  signifies the size of the departed population, distributed in terms of sex, age and educational levels;  $\gamma_7$  signifies the distribution of capital investments in the production and non-production spheres.

It turned out to be technically convenient to combine all of the blocks representing demography, education, labor resources and migration into a single block entitled "Labor Resources."



Table 2

## Capital Investments in Agriculture, billions of rubles [5, 6]\*

№	(а)	Показатели	(б)													
			1960	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
1		(с) млрд. руб.	7,27	7,84	8,62	10,35	11,54	12,43	13,72	15,26	15,71	17,40	19,76	21,63	23,72	25,86
		(д) % к 1960 г.		107,8	108,9	120,1	111,5	107,7	110,4	111,2	102,9	110,8	113,6	109,5	109,7	109,0
2		(с) млрд. руб.	8,00	8,38	7,26	8,64	9,54	10,15	10,84	12,12	12,63	13,20	14,42	18,40	19,90	21,74
		(д) % к 1960 г.		104,7	100,3	119,0	100,4	100,4	100,8	111,8	104,2	112,4	115,6	110,2	110,4	108,8
3		(с) млрд. руб.	1,27	1,26	1,36	1,71	2,00	2,28	2,88	3,14	3,06	3,30	3,34	3,53	3,73	4,12
		(д) % к 1960 г.		99,0	107,9	125,4	117,0	114,0	126,3	109,0	99,8	103,9	104,4	105,7	105,7	110,5
4		(с) млрд. руб.	4,73	5,32	5,90	6,93	7,54	7,87	7,96	8,98	9,55	11,00	13,08	14,37	16,26	17,62
		(д) % к 1960 г.		112,5	110,9	117,5	106,8	104,4	101,4	112,8	106,3	115,2	118,9	111,4	111,6	108,4
5		$\frac{(3)}{(1)} \times 100\%$	17,5	16,1	15,8	16,5	17,3	18,3	21,0	20,6	15,6	18,4	16,9	16,3	15,7	15,9

Key:

- a) Indicators  
 b) Years  
 c) Billions of rubles  
 d) Growth rate
- 1) Total capital investments  
 2) Capital investments in facilities designed for production  
 3) Capital investments in facilities not designed for production  
 4) Difference

\* It was impossible to continue the progression because some of the indicators were incomparable.

Table 3

Actual and Estimated Rural Population Dynamics in the USSR,  
millions of persons

24	Численность сельского населения (а)	(b) Годы									
		1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1	Фактическая	105,9	106,2	106,6	107,9	107,6	106,8	105,2	104,8	103,8	102,5
2	Расчетная	105,7	106,2	107,7	107,1	106,6	105,9	105,3	104,5	103,6	102,6
3	$\frac{(1)-(2)}{(1)} \times 100\%$	0,2	0,6	0,8	0,7	0,7	0,8	-0,6	0,3	0,2	-0,1

Key:

- a) Size of rural population  
b) Years

1. Actual  
2. Estimated

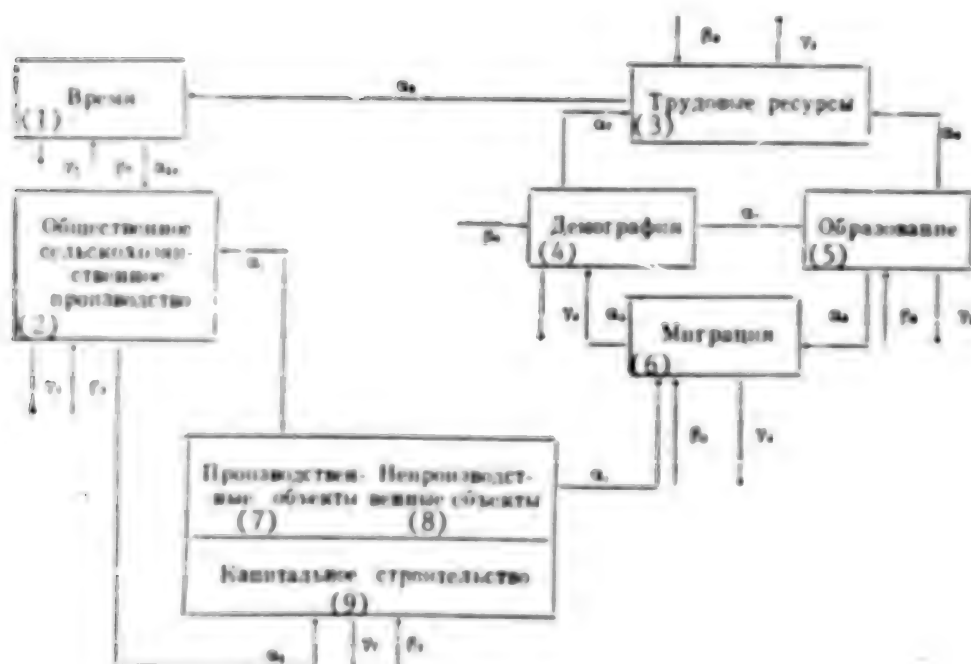


Diagram 1. Nucleus of Informational Model

Key:

- |                                   |                              |
|-----------------------------------|------------------------------|
| 1. Time                           | 6. Migration                 |
| 2. Public agricultural production | 7. Production facilities     |
| 3. Labor resources                | 8. Non-production facilities |
| 4. Demography                     | 9. Capital construction      |
| 5. Education                      |                              |

#### 4. 'Social Production' Block

In view of the fact that one of the goals of rural development is the comprehensive augmentation of agricultural production, a linear programming model was chosen to depict this block:

$$\sum_{t=1}^T \bar{y}^t \rightarrow \max \quad (2)$$

On the condition that

$$-f_{\phi}^0 y_{\phi} (1 - (t-1)b_{\phi}) - f_{\phi}^t \sum_{\tau=1}^t (1 - (t-\tau)b_{\phi}) \Delta y_{\phi}^{\tau} + c_{\phi}^t \bar{y}^t \leq 0, \quad (3)$$

$$\sum_{\phi} \eta_{\phi}^t \Delta y_{\phi}^t + \lambda^t \Delta x^t - K_1^t \leq 0, \quad (4)$$

$$\beta^t \Delta x^t - K_2^t \leq 0, \quad (5)$$

$$K_1^t + K_2^t \leq K^t, \quad (6)$$

$$\begin{aligned} & \sum_{\phi} f_{\lambda\phi}^t \left\{ y_{\phi}^0 (1 - (t-1)b_{\phi}) + \sum_{\tau=1}^t (1 - (t-\tau)b_{\phi}) \Delta y_{\phi}^{\tau} \right\} + \\ & + f_{\lambda}^t \left\{ x^0 (1 - (t-1)d) + \sum_{\tau=1}^t (1 - (t-\tau)d) \Delta x^{\tau} \right\} + \\ & + f_{\lambda}^t \left\{ v^0 (1 - (t-1)v) + \sum_{\tau=1}^t (1 - (t-\tau)v) \Delta v^{\tau} \right\} - \xi^t H^t \leq -m_{\lambda}^0, \quad (7) \end{aligned}$$

$$\sum_{\phi} \eta_{\phi}^t \Delta y_{\phi}^t + \alpha^t \Delta x^t \leq \left[ x^0 (1 - (t-1)d) + \sum_{\tau=1}^t (1 - (t-\tau)d) \Delta x^{\tau} \right], \quad (8)$$

$$\bar{y}^t \geq N^t, \quad (9)$$

$$\pi^t H^t \leq \left[ v^0 (1 - (t-1)v) + \sum_{\tau=1}^t (1 - (t-\tau)v) \Delta v^{\tau} \right], \quad (10)$$

$$\Delta y_{\phi}^t \geq 0, \Delta x^t \geq 0, \Delta v^t \geq 0, K_1^t \geq 0, K_2^t \geq 0, \quad (11)$$

Where  $t$  signifies the year;  $T$  signifies the length of the plan period;  $k$  signifies the qualification category of labor resources employed in agriculture, construction and the non-production sphere;  $\phi$  signifies the type of fixed productive assets in agriculture;  $f_{\phi}^t$  signifies the return on agricultural capital of type  $\phi$  in year  $t$ ;  $\eta_{\phi}^t$ ,  $\lambda^t$ ,  $\beta^t$  signify the capital requirements for the creation of a unit of agricultural, construction and

non-production assets in year  $t$ ;  $r_{k\phi}^t$ ,  $\bar{r}_k^t$ ,  $\hat{r}_k^t$  signify the labor requirements of production, construction and non-production assets of qualification category  $k$  in year  $t$ ;  $\gamma_\phi^t$ ,  $\alpha^t$  signify total construction and installation work for the creation of a unit of production and non-production assets in year  $t$ ;  $b_\phi$ ,  $d$ ,  $v$  signify coefficients of the withdrawal of production, construction and non-production assets;  $n^t$  signifies the norm governing the supply of non-production assets per rural resident;  $\xi^t$  signifies the coefficient of rural employment in social production;  $\xi^t < 1$ ;  $c_\phi^t$  signifies norms of per capita food consumption in year  $t$ ;  $K^t$  signifies total capital investments allocated in the region for the development of the production and non-production spheres;  $H^t$  signifies the size of the working rural population in year  $t$ ;  $m_k^0$  signifies the number of workers in qualification category  $k$ , employed in agriculture, construction and the non-production sphere in rural areas at the beginning of the plan period;  $N^t$  signifies the total population of the region in year  $t$ ;  $y_\phi^0$ ,  $x^0$ ,  $z^0$  signify total production, construction and non-production assets respectively, available at the beginning of the plan period;  $\Delta y_\phi^t$ ,  $\Delta x^t$ ,  $\Delta z^t$  signify the unknown increments in volumes of agricultural, construction and non-production assets in year  $t$ ;  $K_1^t$ ,  $K_2^t$  signify the unknown volumes of capital investments in the production and non-production spheres in year  $t$ ;  $\bar{y}^t$  signifies the unknown quantity of food products in year  $t$ .

Three spheres are actually reflected in the model: agriculture, construction and the non-production sphere. Their volume is measured in terms of fixed assets; this means that expenditure-output coefficients for each variable in a particular field of activity are calculated per unit of fixed capital. The non-production sphere is only partially represented--only the balance fixed assets of agricultural enterprises. The structure of models, naturally, does not depend on the departmental jurisdiction of fixed assets. Later, when information can be obtained in regard to all non-production assets and labor resources in the non-production sphere as a whole, this defect can be eliminated.

The following subbranches of agriculture are represented in the model: cattle-breeding, hog-breeding, sheep-breeding, poultry-breeding and the cultivation of commercial grain, potatoes and vegetables. The volume of agricultural production of a certain type  $y_\phi$  in year  $t$  is the sum of the production volume achieved the preceding year and its increment in year  $t$  in the form  $y_\phi^{t-1} + \Delta y_\phi^t$ . Fodder production is not directly represented. Expenditures of all resources on fodder are reflected in the variables for animal husbandry. The final products of agriculture are grain (converted to flour units), potatoes, vegetables, milk, meat of all types and eggs. In the model, this volume is determined with the aid of per capita consumption norms and the size of the regional population; shipments of public and private farming products out of the region are taken into account, with absolute quantities set exogenically.

Activity in construction and the non-production sphere is represented in the model by volumes of fixed assets, carried over from each year to the next. As we can see, in comparison to other formulations of this problem

(by prominent authors), this one is distinguished by, firstly, the fact that the variation of all quantities, with the exception of the functional, takes place in terms of increments and, secondly, the institution of limits from below on the production of food for the population of the entire region in each year. This makes it possible to obtain smooth transitions, without the sharp intervals characteristic of linear optimization models.

We know that private subsidiary farming plays an important role in providing the population with agricultural products. Activity in the private farming sphere is not directly reflected in the model, but theories concerning the development of private subsidiary farming are reflected on the level of restrictions set from below on the production of foodstuffs in the public sector. The time spent in private farming (the direct diversion of labor resources from the sphere of public production and the total workload) is taken into account in the "Time Balance" block.

Obviously, in this form the model aids in determining: 1) the maximum possible quantities of agricultural products that can be shipped out of the region in view of assigned consumption norms; 2) the possibilities and minimum time limits for the achievement of assigned food consumption norms; 3) the maximum number of individuals whose needs can be satisfied by the given region in line with assigned consumption norms; 4) the distribution of capital investments in the production and non-production spheres, ensuring, to some extent, minimal shortages of all types of resources.

At present, until the IM nucleus begins to "work" as a unified system, the following modification of the "Social Production" block is implemented.

Two additional conditions are added:

$$H^0 + \sum_{\tau=1}^t R^{\tau} (K_1^{\tau} - K_2^{\tau}) = H^t, \quad (12)$$

$$K_1^{\tau} - K_2^{\tau} \geq 0, \quad \tau = 1, \dots, t, \quad (13)$$

Where  $R^{\tau}$  signifies the coefficient of migrant departures from rural areas, corresponding to the indicator of capital investment differences in (1). It is understandable that finding the specific  $R_k^{\tau}$  coefficient for each qualification category is an extremely complex empirical task. We have not done this, but we have employed the hypothesis that departing labor resources are always distributed proportionally among various qualification categories in the base period. It is obvious that this is incorrect, since the data of many years of observations indicate heightened migration activity on the part of groups with higher qualifications. In this sense, the modification creates an "absorbing" medium for production and is distinguished by a kind of "heightened optimism." But this "optimism" does not disturb us because the production volumes derived in the solution are regarded as maximum quantities in the forecast. This shortcoming is absent from the IM nucleus.



Besides this, (12) also suffers from another shortcoming--it is assumed that the coefficient  $R$  does not depend on the difference  $K_1 - K_2$ . It should be assumed that  $R$ , even though a monotonic progressive function of  $K_1 - K_2$ , is linear in the simplest case, when  $N_{t+1} = N_t - \alpha(K_1 - K_2)^2$ , where  $\alpha$  signifies the coefficient of balance. With this kind of nonlinear function, optimization is only possible with the aid of the following iterative arrangement. With a given distribution of capital investments in the production and non-production spheres, the above problem is solved in regard to the linear programming of maximum food product variety. If labor resources are limited, the distribution changes: They increase per unit of capital investments in the non-production sphere, and the appropriate plan is then sought. A new distribution is then set forth, and so forth, as long as labor resources remain limited. If at some stage capital investments turn out to be limited rather than labor resources, redistribution is carried out in favor of the production sphere--that is, a step backward is taken. If the plan does not allow for improvement as a result of the use of interchangeable labor resources and capital investments, it corresponds to the minimum shortage of resources. The criteria for completing the search for solutions in accordance with this scheme are analogous to the criteria for the gradient procedures of optimization. By the nature of this process, the solutions will eventually converge, and the speed of convergence can be regulated by progress in the redistribution of capital investments. The disparity (13) is an equalizing factor and does not keep labor resources in rural areas as a result of the rapid development of the non-production sphere. We do not know of a single case in which capital investments in the non-production sphere of Siberian regions were greater than investments in the production sphere (just as, incidentally, in the USSR as a whole).

## 5. 'Labor Resources' Block

We have already noted that it is convenient to combine the model of demographic processes and education and the balance of labor resources in this block for many reasons. It will become apparent below that the demography and education models are extremely similar, and the balance of labor resources correlates well with them.

In almost any forecast of regional development, the central issue is the size of the future population and some of its qualitative characteristics. Among the latter, the sex and age composition, educational structure and employment rate are of special significance. They are apparently not independent. We feel it is necessary to take some of these into account in the model, basing our deductions on widely known facts.

1. The demographic structure affects the educational structure in such a way that its average level represents a nondecreasing function of the percentage of the regional population aged 19 to 25.
2. The total population figure and demographic structure depend on the educational structure of the regional population. In fact, it is known [4] that educated population groups are distinguished by intensive migration.

3. The demographic structure largely determines the number of employed, and the educational structure determines their qualitative composition.

4. The efficient utilization of labor resources leads to the improvement of all living conditions and, consequently, to less migration.

The latter can only be taken into account if the IM nucleus operates as a single entity.

To depict this model, we will introduce new symbols:  $\beta$  signifies sex,  $\beta = 1, 2$ ;  $i$  signifies age,  $i = 1, \dots, 100$ ;  $r$  signifies educational level,  $r = 1, \dots, R$ ;  $\phi$  signifies branch of non-production sphere;  $j$  signifies number of qualification category,  $j = 1, \dots, J$ ;  $N_{\beta}^{it}$  signifies the R-vector-line, the elements of which represent the number of persons of sex  $\beta$ , education  $r$ , age  $i$  in year  $t$ ;  $\delta^{it}$  signifies the special birth rate coefficient;  $h_{\beta}^{it}$  signifies the longevity coefficient;  $M_{\beta}^i$  signifies the R-vector-line of coefficients of migration balance (that is, migration balance in relation to the size of the group);  $A_{\beta}^i$  signifies the  $R \times R$ -matrix of transition coefficients of educational groups for types of full-time education;  $\pi_1^{\beta}$  signifies the coefficient of labor participation by individuals of age group  $i$  and sex  $\beta$ ;  $TR^j$  signifies the J-vector-line of indicators of the quantity of labor resources in qualification category  $j$ ;  $D^j$  signifies the J-vector-line of indicators of the number of women in qualification category  $j$  occupied with private farming and housework;  $YR^j$  signifies the J-vector-line of indicators of the number of full-time students of qualification category  $j$ ;  $L^j$  signifies the J-vector-line of indicators of the number of workers in qualification category  $j$  employed in the national economy in rural areas;  $E_{\phi}^j$  signifies the J-vector-line of employment normatives of qualification category  $j$  in branch  $\phi$  of the non-production sphere;  $H^j$  signifies the J-vector-line of indicators of the number of persons employed in the rural production sphere;  $E$  signifies the R-vector-column;  $C_{\beta}$  signifies the R-vector-line with its element corresponding to the group with the lowest educational level equal to the percentage of children of sex  $\beta$  among all newborn infants and all other elements equivalent to zero;  $B$  signifies the  $R \times J$ -matrix, the coefficients of which are  $b_j = 1$  if educational group  $r$  is in qualification category  $j$ , and  $b_{ij} = 0$  in the opposite case;  $\otimes$  signifies the operation by which vectors are multiplied element by element.

Using these symbols, the model equations are:

$$N_{\beta}^{i+1, t+1} = h_{\beta}^{it} (N_{\beta}^{it} A_{\beta}^{it}) \otimes M_{\beta}^{it}, \quad (14)$$

$$n^i = \frac{1}{2} \sum_{t=0}^{\infty} [(N_1^{it} + N_2^{it} h_1^{it-1}) \delta^{it-1}] E, \quad (15)$$

$$N_{\beta}^{i+1, t+1} = \frac{1}{2} N_{\beta}^{it} + \frac{1}{2} n^i h_{\beta}^{it} C_{\beta}, \quad (16)$$

$$TR^t = \sum_{p=1}^2 \sum_{i=0}^{100} \pi_p^i N_p^{i,t} B, \quad (17)$$

$$D^t = \frac{1}{2} \left[ \sum_{i=18}^{60} (N_1^{i,t} + N_1^{i-1,t} h_1^{i-1,t}) \delta^{i,t} \right] B + \\ + \frac{d}{2} \left[ \sum_{t=2}^3 \sum_{i=18}^{60} [(N_1^{i,t-1} + N_1^{i-1,t-1} h_1^{i-1,t-1}) \delta^{i,t-1}] B \right], \quad (18)$$

$$YR^t = \left( \sum_{p=1}^2 \sum_{i=0}^{100} N_p^{i,t} A_p^{i,t} E, 0, \dots, 0 \right) + R^t, \quad (19)$$

$$L^t = TR^t - D^t - YR^t, \quad (20)$$

$$H^t = L^t - \sum_i \left( \frac{z_i^t}{z_i^0} \odot \sum_{p=1}^2 \sum_{i=0}^{100} N_p^{i,t} \right), \quad (21)$$

As we can see from (14)-(16), the traditional method of age progression is used in the model [7], in combination with the Markovian model of educational growth [8]; the normative method is used to determine the balance of labor resources [9]. The essence of this method is that, when calculations are made for the long range, the socioconsumer infrastructure and normal living conditions are planned first, and the development of physical production branches is only planned after this. In (19), the specific features of rural education are taken into account; as a rule, persons with low qualifications generally study full-time here.

The proposed model calls for the following initial information: 1) the initial sex and age composition and educational structure of the population; 2) information about natural and mechanical population mobility; 3) matrices of transitions between educational groups; 4) information about the labor participation of persons of various age groups (the percentage of working adolescents in the population below working age, and the percentage of working pensioners in the population of retirement age; for the working-age population, this is the percentage engaged in social production, private farming and housework and full-time students); 5) normatives of employment in the branches of the non-production sphere.

All of the information, with the exception of data on initial conditions, is of a hypothetical nature. The mechanical mobility of the population (migration away from rural areas) as a whole can be depicted in the social production block, but coefficients of the migration balance, differentiated in terms of sex, age and education, are needed for the model. Their calculation is a complex task because there are no statistics on migration in relation to educational level.

The proposed method for calculating migration coefficients for various educational groups is based on the assumed invariability of the educational

structure of the population for an entire year.\* This kind of stability is the result of two processes: the functioning of the educational system and the "eradication" of the most highly educated segment of the population from rural areas by means of migration.

We will designate  $b_j^t$  to signify the size of educational group  $j$  aged 10 years and up at the beginning of year  $t$ ;  $B^t = \sum_j b_j^t$ ;  $f_j$  to signify the number of persons who have progressed from the preceding age group to the group "10 years and up" during year  $t$  and who belong to educational group  $j$ ; \*\* $F = \sum_j f_j$ ;  $c_{ij}$  to signify the number of persons progressing from educational group  $i$  to group  $j$  aged 10 years and up during year  $t$ ;  $d_j$  to signify the number of persons who died during the year, aged 10 years and up, and with  $j$  education;  $D = \sum_j d_j$ ;  $\Delta = D/B^t$ ;  $m_j$  to signify the migration balance during year  $t$  for persons aged 10 years and up with education  $j$ ;  $M = \sum_j m_j$ ,  $\mu = M/B^t$ ;  $\nu_j$  to signify the unknown coefficient of migration balance for educational group  $j$ ;  $\nu_j = m_j/b_j$ .

With  $B^{t+1} = B^t - D + M + F$ , we can say:

$$\alpha = B^{t+1}/B^t = 1 - \Delta + \mu + F/B^t. \quad (22)$$

In view of the fact that the educational structure of the population has been assumed invariable, then  $b_j^{t+1} = \alpha b_j^t$ , but

$$b_j^{t+1} = b_j - d_j + m_j + f_j + \sum_i c_{ij} - \sum_i c_{ji} \text{ or} \\ \alpha = 1 - \Delta + \mu_j + (f_j + \sum_i c_{ij} - \sum_i c_{ji}) / b_j^{t+1}. \quad (23)$$

Taking (22) and (23), we derive  $\mu_j = - (f_j + \sum_i c_{ij} - \sum_i c_{ji}) / b_j^t + \mu + F/B$ .

The use of this method eliminates the need to calculate the quantities  $m_j$ , which cannot now be derived from state statistical information. Coefficients of the migration balance, calculated with the aid of the method set forth above, are presented in Table 4.

\* For example, according to census data, the rural population of West Siberia had an average of 3.4 years of education in 1959 and 4.3 years in 1970--that is, the figure rose by an average of 0.08 years annually [10].

\*\* To keep the equations from becoming unwieldy, we will omit the year index from variables of migration patterns. Hereafter it can be assumed that these variables apply to the period between  $t$  and  $t+1$ .

\*\*\* It is assumed that the mortality rate does not depend on education;  $d_j/b_j^t = \Delta$ .

Table 4

Coefficients of Migration Balance for Rural Residents of Both  
Sexes Aged 10 Years and Up, for Novosibirskaya Oblast, in  
1970, decimal values

Educational groups	Coefficients of migration balance
Less than partial secondary	+0.025
Partial secondary	-0.100
Complete secondary	-0.214
Secondary technical	-0.051
Higher	-0.033

When this block was modeled, it was again necessary to resort to several oversimplifications and conditional statements. The main ones were the following hypotheses.

1. Movement between educational groups is Markovian in nature and, consequently, the conditions influencing this process are invariable or only slightly variable. Even given the permanence of conditions, however, this assumption is fairly strong.

2. The proportion of labor resources allocated for public agriculture and the non-production sphere, differentiated in terms of qualification categories, depends on qualitative considerations independent of the model.

Therefore, the final data of the "Labor Resources" block pertains to the size of various groups of workers who could be employed in agriculture, construction and the non-production sphere. It is understandable that limitations on size in the "Social Production" block can only be used conditionally because the main role here is played by the amount of working time available to labor resources. The conversion of numerical indicators into descriptions of working time is accomplished in the "Time Balance" block.

#### 6. 'Time Balance' Block

The results of studies of the time schedules of Novosibirskaya Oblast's rural population in 1975 and 1976 indicated that the average length of the working day varied in different seasons, types of settlements, professional groups of workers and so forth. Calculation of the total amount of working time and its distribution among qualification categories (with consideration for the most important factors determining the length of work hours) will make it possible to predict this quantity in terms of man-hours and the number of some "hypothetical" groups of workers and, in this way, to disclose the imbalance in labor resources within the accuracy limits of the model. In addition, this block should provide information about average expenditures of time on work in social production, private farming and housework and about the quantity of leisure time.



The "Time Balance" block is constructed on the basis of the hypothesis that the population can be divided into groups characterized by sufficient similarity in their distribution of time among various types of activity due to the similarity of external conditions and the value systems of members of these groups. In this case, the average time schedule or total time balance will be calculated as correlations to the size of these groups; that is, the population structure. In order to distinguish between groups with relatively identical time schedules, it is necessary to either use the known methods of taxonomy or to break down the total amount of time by means of a system of factors having the greatest effect on time schedules and by verifying the value of this breakdown.

When the "Time Balance" block was being constructed, it was assumed that groups of this kind had already been found, and the proposed initial information was therefore the "Forecast of Population Distribution Among Given Social Groups," which is the final information of the "Labor Resources" block. A second set of initial information came from the "Distribution of Time in the Pre-Forecast Period Within Given Groups." This distribution should serve as a basis for extrapolation.

Work with this block begins with the forecasting of average time expenditures on certain types of activities which interest us on the basis of the time schedules of the given population groups, calculated according to survey materials. This generally requires additional information about possible changes in external conditions. For example, we could test a developmental variant envisaging considerable change in the conditions of private subsidiary farming, or a variant with a level of labor productivity which could reduce the length of the work schedule by, for instance, an hour, and so forth. Each variant of this type requires preliminary research based on empirical data: the determination of natural tendencies in the distribution of time transferred from one particular field of activity to others, and so forth. At present, it is assumed that there will be no considerable changes in the time schedules of rural residents of certain categories within the next 10-20 years, and changes in average and total time expenditures on various types of activity will essentially result from changes in the rural population structure. For this reason, forecasted average time expenditures are calculated in the "Time Balance" block for each year on the basis of information about the population structure. If the group of types of activities used as a basis for calculating total time expenditures is complete (that is, if total expenditures on the entire group per individual amount to 24 hours), the distribution of average time expenditures among types of activity will represent the time schedule and the distribution of total available time will represent the time balance. In the same way, the balance of working time can be derived, if total expenditures on all types of activity examined are equivalent, per worker, to the average length of work time.

The workings of the "Time Balance" block are presented in general form in Diagram 2.



Diagram 2. Structure of 'Time' Block

Key:

- |  |  |
|--|--|
| 1. Initial data  | 6. Results of forecast or hypothesis about changes in time distribution within given groups during forecast period |
| 2. Final data  | 7. Predicted average expenditures per year of forecast period in each group  |
| 3. Population distribution among given social groups               | 8. Total time expenditures or balance per year for each group  |
| 4. Distribution of time in pre-forecast period within given groups | 9. Total time expenditures or balance over entire period for each group  |
| 5. Information about changes in conditions                         |  |

We will use the symbols introduced in our description of the "Labor Resources" block, with the following additions:  $x_{i\beta}^{rt}$  signifies the number of persons of age  $i$ , sex  $\beta$  and educational group  $r$  in year  $t$ ;  $k_{i\beta}$  signifies coefficients of disability, differentiated in terms of sex and age;  $\pi_{i\beta}$  signifies the percentage of working pensioners of age  $i$  and sex  $\beta$ ;  $\tau_{i\beta}^{rt}$  signifies the estimated or predicted average working time of persons of age  $i$ , sex  $\beta$  and qualification category  $r$  in year  $t$  (per day, week, year and so forth);  $\delta_{ij}$  signifies the Kronecker delta.

Using these symbols, we derive the total amount of working time (daily, annual and so forth):

$$T_j^t = \sum_{\tau \in H_j} \left( \sum_{i=18}^{100} x_{i1}^{\tau t} (1 - k_{i1}) \tau_{i1}^{\tau t} + \sum_{i=18}^{14} x_{i2}^{\tau t} (1 - k_{i2}) \tau_{i2}^{\tau t} \right) + \\ + \sum_{\tau \in H_j} \left( \sum_{i=18}^{100} x_{i3}^{\tau t} \tau_{i3}^{\tau t} + \sum_{i=18}^{14} x_{i4}^{\tau t} \tau_{i4}^{\tau t} \right) + \delta_{j1} \sum_{i=18}^{13} \sum_{\tau=1}^6 \sum_{p=1}^2 x_{i5}^{\tau t} \tau_{i5}^{\tau t}. \quad (24)$$

One initial set of information should be population distribution among different types of populated points. In [11], the findings of sample studies conducted in rural areas of Novosibirskaya Oblast in 1967 and 1972 were used to categorize rural populated points according to three factors: urbanization, economic structure and demographic status. The hypothesis concerning the deciding influence of these factors on the time schedules of rural residents was confirmed.

## 7. Program Software

The resolution of all these problems is ensured by computer programs. The linear programming problem in the "Social Production" block is solved with the aid of LPS-360 on an EC computer. The rest of the programs were originally prepared for the A-220 computer. They were worked out in such a way that it is possible to work with each block separately. Besides this, the "Labor Resources" block allows for modification, presupposing the analysis of only the demographic aspect or only educational problems.

The three blocks examined are not technically connected by a single computer procedure, which is absolutely essential in work with numerous variants. Future plans call for the construction of a complex of programs, using the same language, for the EC computer in a form allowing for work with each block individually.

The basic method of identifying problems in the IM nucleus is the derivation of inadmissible plans for objectives (2)-(11), which indicate, for example, a shortage of capital investments or labor resources.

As we can see, the IM nucleus is open at both ends so that models of new blocks can be joined onto it. In our opinion, the first of these should be the particular blocks for which the most crude and unrealistic hypotheses were made in the nucleus. These primarily include capital construction and the rural non-production sphere, which are represented in extremely general form in the "Social Production" block. Besides this, extremely important production conditions--the economic management mechanism and the type of labor and production organization--are reflected in the block only indirectly, through the appropriate technological coefficients. The construction of models depicting these coefficients represents one of the possible solutions to the problem.

In the "Labor Resources" block, education is only represented by full-time students. In essence, the distribution and redistribution of the population

among different levels and types of education are being modeled. An appropriate model will have to be constructed to depict the material, technical and personnel requirements of the educational system. Demographic population characteristics (birth and mortality rates) are now established exogenically with the aid of experts. The construction of a model of the public health system will make the more objective derivation of these characteristics possible. A model of the public health system will also provide for the sounder determination of the number of persons of working age and the total amount of temporary disability for the "Time Balance" block.

The modeling of territorial settlement patterns represents an extremely serious problem. It is a particularly pressing problem in the forecasting of Siberian rural development due to the relatively high degree of population dispersion, the small number of large cities, the inadequate transportation network and the intensity of rural migration patterns. Obviously, any change in the system of population settlement will have a serious effect on all aspects of rural life.

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### THIRD QUARTER RESULTS OF RIVER FLEET OPERATIONS REPORTED

Moscow VODNYI TRANSPORT in Russian 11 Oct 79 p 1

[Article: "Final Stage"]

[Text] The third quarter of the Five-Year Plan's fourth year has ended. The volume of freight shipments for the Ministry of the River Fleet as a whole held at the same level as for the same period last year with an increase of 1.6 percent in bulk-oil shipments and 3.4 percent in dry-cargo handling.

In comparison with the third quarter of last year shipments increased on such cargoes as salt — by 5.3 percent, iron ore — by 12.3, non-ferrous ores — by 7.1, construction articles — by 5.4 industrial raw materials — by 1.1, and other goods — by 4.1 percent. Deliveries of import-export cargoes grew by 1.1 percent for the same period. Much work was accomplished in forwarding watermelons and tomatoes from Astrakhanskaya and Volgogradskaya oblasts to the central and industrial regions of the European part of the country. Thus, these shipments rose by 8.5 percent over the same period last year.

In the third quarter river workers of the eastern basins delivered over 600,000 tons of varied cargo above the plan to points in the oil and gas drilling regions of Western Siberia.

At the same time underfulfillment by timber-rafting organizations in moving rafts by 12.7 percent of the quarter plan for tonnage and 19 percent of freight turnover for timber on ships, as well as the difficult navigation conditions in a number of basins, has had a negative effect on fulfilling the quarterly and September goals as a whole for the branch.

The third quarter freight shipment plan was only fulfilled by 98.2 percent for tonnage and 93.3 percent for freight turnover. And the planned target for September was only met by 96.9 and 91.5 percent respectively.

Competing groups during the last period and especially in September made every effort to close the gap.

**Shipping Plan Fulfillment for September and Third Quarter 1979**  
(Based on Operational Estimates)  
(In Percent)

Steamship Company	September		3rd Quarter	
	Tons	Freight Turnover	Tons	Freight Turnover
Volgotanker	100.9	96	99	96.9
Volga United	96	85.2	99.5	92.7
Moscow	100.2	104.2	100.1	100.3
Kana	100.8	83.6	99.1	86.8
Vyatka	90	68.8	99.2	76.2
Bal'skiy	103.3	102.3	104.6	106.1
Volgo-Don	95.1	93	98.7	98.5
Kuban'	100.2	102.7	106.5	108.1
Northern	84.7	74.1	93.2	84.2
Sukhona	91	77.6	95.3	87.4
Northwestern	100.8	104.8	101.2	103.3
Belomorsk-Onega	89.3	89.8	95	97.3
Pechora	78	91.5	102.7	103.4
Western	98	96	101.6	100.6
Irtysk	104.8	103.7	103.2	104
West Siberian	100.1	101.6	97.7	99.3
Yenisey	93.1	83.7	97.7	88.6
East Siberian	95.1	84.4	100	95.6
Amur	95.2	86.4	84.3	68.2
Lena United	93.1	82.9	90.4	73.4
<b>Ministry of the River Fleet</b>	<b>96.9</b>	<b>91.5</b>	<b>98.2</b>	<b>93.3</b>

As usual the people from the Northwestern, Moscow and Kuban' steamship companies are among the leaders in the competition.

It must be noted that not all river worker units made full use of existing reserves for increasing the carrying capacity of the transport fleet. Despite adopted measures, shipping companies have committed a number of mistakes in their operations. In September various ports failed to properly process the transit fleet and as a result above-plan idleness of ships involved in loading operations alone amounted to over 3 million ton-days. The fleet encountered long delays at Nadya, Urengoye, Kotlas, Cherepovets, Perm', Ust-Donetsk and a number of other ports.

Poor railroad operations are having a negative effect on fulfillment of the shipping plan. Over 108,000 rail cars failed to meet loading norms during the latest period. This led to an accumulation of more than 6 million various loads at ports involved in a second transshipment.

In September, as in past months, significant drops in the fleet's carrying capacity occurred due to delays in navigation season repairs. Especially lengthy idle times due to repair were found in the following steamship companies: Volgotanker, Northwestern, Volgo-Don and Yenisey.

Neighboring steamship companies of the central and northwest basins did not meet the freight shipment plan for inter-basin operations. The Volga United, Kama and Volgo-Don steamship companies were the worst offenders in inter-basin shipping. In a number of adjoining steamship companies (the Kama, Volgo-Don and Northwestern) above-norm delays in ship turnaround occurred.

River workers of the RSFSR have now entered the final navigation period. In a number of basins it is already nearing an end. The planned shipment of goods for October as a whole is set to rise by 1.2 percent for tonnage and 0.6 percent for freight turnover over last year. An especially large increase in freight turnover has to be achieved by the Bel'skiy, Kama, Belomorsk-Onega and Yenisey steamship lines.

In order to successfully fulfill the plan for October and for the fourth quarter as a whole, steamship line people must provide smooth operations between the fleet and ports before the freeze-up. As soon as possible it is necessary to ready the ice-breaker fleet and transport fleet assigned for duty in the extended navigation period, accumulate the appropriate amount of goods at ports, and place the ice-breaker fleet in operational locations. It is now time to outline specific measures for overseeing the operations of the ice-breaker and transport fleet.

The steamship lines of the eastern basins complete their work in October. Therefore the main task of these units is to take the necessary steps for the complete unloading of ships located in northern regions and for their rapid and safe return from polar areas to their planned wintering-over points.

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## TRANSPORTATION

### FULFILLMENT OF MARITIME FLEET 9-MONTH PLAN REPORTED

Moscow VODNYI TRANSPORT in Russian 11 Oct 79 p 1

[Article: "Step Up Work Tempos"]

[Text] Today many people from maritime ships, KhEGS [Cost-Accounting Operations Ship Groups], and integrated composite brigades of the branch are reporting on fulfillment of production plans and adopted socialist obligations. The success of one of the initiators of socialist competition -- the workers from the Baltic Maritime Steamship Company, who have fulfilled the plan for four years of the Five-Year Plan for production and financing ahead of schedule--deserves mentioning.

September and the third quarter as a whole were periods of intensive and strenuous work in maritime transportation. The ministry's September plan for domestic shipping was fulfilled by 100.4 percent and for foreign shipments by 100.8 percent.

Container shipments for all types of operations came to over 600,000 tons and packet shipments totalled more than 1 million tons. In September, as is usually the case at this time of year, passenger traffic declined significantly compared to August, but volume was still quite large and amounted to 5.6 million people. The shipment of all cargoes to Arctic points and other remote regions of the country with limited navigation seasons continued. Deliveries of goods to Cuba and Vietnam were large, as were timber shipments for export, including those from Igarka, oil and petroleum products, imported pipe, equipment, and industrial goods and foodstuffs for consumers. Nevertheless there still were numerous foul-ups and unresolved problems in this work. Ship schedules and time-tables are not being adhered to, and foreign trade needs are not always being fully met for cargo shipments on a number of important routes.

Operations data for the branch for the nine-month period have been totalled. The domestic shipping plan was fulfilled as a whole for the ministry by 101.9 percent. All steamship companies, except the Caspian and Kamchatka, met their goals for this plan. The Caspian Steamship Company did not fulfill its plan because oil workers failed to carry out their obligations to provide cargo for shipment. The slowdown at the Kamchatka Steamship Company resulted primarily due to shortcomings in operations.

**Fulfillment of Nine-Month Plan (in Percentage)**

Steamship Companies and State Economic Associations (GKhO)	Domestic Shipping	Foreign Shipping
Northern	101.2	100.2
Murmansk	100.2	100.8
Baltic	-	104.7
Estonian	114.0	101.1
Latvian	115.4	109.6
Lithuanian	-	100.9
Total for GKhO "Sevzapflot"	106.9	104.4
Danube	106.1	103.7
Azov	102.6	100.9
Black Sea	-	101.0
Novorossiysk	121.1	109.3
Georgian	102.2	101.8
Caspian	98.7	109.8
Total for GKhO "Yuzhflot"	102.0	103.8
Far Eastern	102.0	98.5
Kamchatka	97.1	109.8
Sakhalin	100.4	105.8
Maritime	99.6	115.5
Total for GKhO "Dal'flot"	100.1	100.7

The nine-month shipping plan for foreign operations was fulfilled by 103.6 percent for the branch. Only the Far Eastern Steamship Company, which fulfilled the plan in the second and third quarters, was lagging for the nine-month period. It has not been able to overcome the first quarter loss.

Port workers fulfilled the nine-month loading-unloading plan by 103.4 percent with the figures for the state economic associations (GKhO) as follows: "Sevzapflot" -- 102.9, "Yuzhflot" -- 104.1, and "Dal'flot" -- 102.3 percent. Work on improving the continuous plan-schedule within transport terminals has continued at ports. Thanks to the steps taken by the Ministry of Railways the supply of railroad cars to ports is improving. It is the job of port workers to make sure that all cars are fully loaded in a timely manner, and to see that they are unloaded without delays.

Now maritime transport workers are working to fulfill the October plans and their socialist obligations undertaken in honor of the 62nd anniversary of the October revolution, which will form a base for the successful carrying out of the plans for the fourth year of the Five-Year Plan as a whole.

The Central Asian Steamship Company fulfilled the nine-month plan for all types of shipping by 114.5 percent for tonnage and 109.7 percent for ton-miles.



## TRANSPORTATION

### MORE REALISTIC INDICES NEEDED AT MARITIME PORTS

Moscow VODNYI TRANSPORT in Russian 11 Oct 79 p 2

[Article by S. Kleynerman, deputy chief of port services of the Novorossiysk Steamship Company: "For Maritime Ports--A System of Indices"]

[Text] The rise in the scale and complexity of maritime transport container operations has led to an increase in the role of ports in the activities of the modern-day transport fleet. Power fulfillment of the tasks involving fleet processing and servicing, accelerating the transshipment of freight, and improving passenger service depends on the coordinated and productive work of all port units.

The development and functioning of a production system are determined by operating parameters, plans and indices which guide it along a set course. Based on these items it is necessary to examine existing port indices, evaluate their shortcomings, and come up with the ideal system which ensures unity of purpose at all levels of management.

At present port production plans are measured in physical tons. This index does not reflect the work of a large number of port units -- the port fleet and maritime terminal, fuel area, and repair shops.

All assessments of port operations, from fulfillment of plans by volume, labor productivity and wage utilization to bonuses and standings in socialist competition, are made based only on figures from freight operations and do not reflect all the varied activities of port personnel. Moreover, one of the basic principles of administration is being violated -- unity of purpose.

As a result auxiliary elements for the most part perform unsatisfactorily at ports. Freight personnel are forced to be involved with repair and other auxiliary operations to the detriment of the processing of cargo carriers.

The "physical ton" index does not take into consideration the labor-intensiveness nor the cost of handling various cargoes and does not provide any economic information. There are no average tons -- there is a ton of

cotton or equipment or sand, each with its own handling techniques and labor and monetary inputs. Freight areas and the port as a whole are giving most of their attention to fulfilling the plan in tons, often with a negative effect on the pace of processing ships, primarily involving the labor-intensive general, though high-rate, cargoes.

Income, which reflects the amount of all port work in cost terms, should be a port production index. It is a good idea to retain physical tons for calculations. Also it is necessary to set up a physical index for ports -- the amount of handling of major cargoes supported by direct long-term agreements with clients and foreign trade associations. There are no agreements between ports and association now, so it is necessary to move ahead with this important work.

The income index is fully balanced with the labor productivity index, as well as with the planning of the wage fund per ruble of production. It will be based on stable transportation rates, including job rates, which has been provided in the decree. In situations where ports render transport services without creating new goods, the income index corresponds to the industrial index of net output.

Fulfillment of the profit plan should be the main financial index and the criterion of economic efficiency. As for profit being a criterion of efficiency we have in mind the incentives at all levels for overfulfillment of this index, which estimates the savings in living and national labor, which is, according to the well-known concept of Marxism, the basis of all social progress. For this we must not only introduce stable norms for the formation of economic incentive funds, but also simple, descriptive norms related to the source of capital formation, the plan and profitability, which evoke in each port worker a real interest in efficient work.

A direct deduction of a set amount from the profits received by the port and subunit can serve as such a norm. It is necessary to set up material incentive funds not only for the port as a whole, but also for each integral subunit according to these norms. Funds which will serve as powerful stimuli for highly productive labor and overfulfillment of production and financial plans which are imbedded in the Leninist principles of cost accounting. At present these funds are not being set up at maritime ports, and the experience of the country's advanced enterprises is not being used.

A unified system of work indices for ports and a bonus system tied to it will evaluate the real contribution of the port, the members of each subunit, and each port worker in carrying out the assigned tasks.

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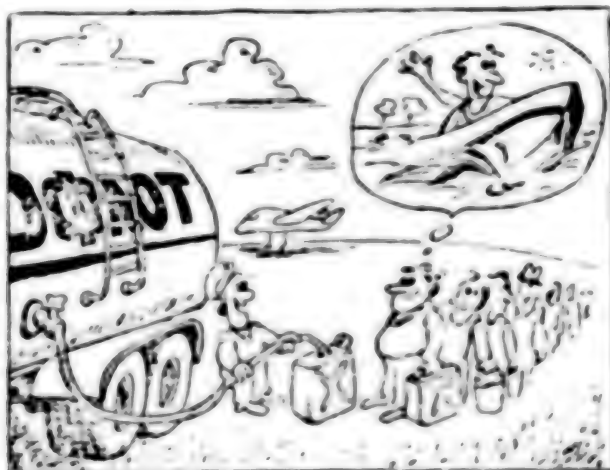
## TRANSPORTATION

### AIRCRAFT FUEL DIVERTED FOR PRIVATE USE

Moscow VOZDUSHNYY TRANSPORT in Russian 1 Sep 79 p 4

[Cartoon by Yu. Ivanova and poem by P. Razgonov: "On the 'Little Fleet' and the Treasury"]

[Text] The editors have received warnings that as a result of a lack of control in certain air enterprises, fuel is being wasted in "supplying" it to the owners of launches and motor boats.



Where work is neglected,  
Where control and accounting are forgotten,  
A "little fleet" has taken shelter  
Under the Aeroflot wing.

If you want to go hunt,  
Here there is no problem:  
A kind fellow will give you  
As much as you want from the dump,  
For a bottle, for some "paper,"  
For pretty eyes.

Just bring a container,  
Here it is, clean as a whisk!  
The "captains" do not dawdle,  
And the tanks are quickly filled,  
And gratitude is complete.  
One after another they are filled  
For the expanses of the river's waves,  
Cheerfully the songs ring out,  
Things are opened and passed around--  
They are off to the in-laws for a meal...  
How they will please them!  
And the home-made brew will flow!  
You scratch my back, I'll scratch yours,  
And let the treasury foot the bill!

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## TRANSPORTATION

### CZECH-BUILT TROLLEYBUSES IN SERVICE

Kiev PRAVDA UKRAINY in Russian 12 Oct 79 p 4

[Article by Ye. Guzhva: "Trolleybus No 5000"]

[Text] The 5000th trolleybus manufactured in the CSSR for the Soviet Union has been put into service on the streets of Kiev. The jubilee vehicle, like all the preceding ones, carried the emblem of a winged arrow, the trade mark of the Skoda enterprise.

"The Czech trolleybuses have served well on our lines," said V. K. D'yakonov, chief of the Kiev Streetcar and Trolleybus Administration. "Their performance, particularly the electrical and brake systems, makes it possible to operate the vehicles dependably on all the routes of our city. Presently Kiev has 1,136 Skoda trolleybuses, and they carry a million passengers per day. This type of transport handles 28 percent of the total passenger traffic."

We might add that now the Czech buses are operating in 31 cities of our nation, including in 17 in the Ukraine alone. They easily handle long, steep grades, they have good maneuverability and stand up under various weather conditions.

The 5000th trolleybus has been put into service on route 20 of Kiev by the leading driver, V. A. Oleynikov. Vitaliy Aleksandrovich [Oleynikov] has worked 23 years now at the streetcar and trolleybus administration, and 15 of these years have been spent behind the wheel of a Skoda vehicle. The leading driver is one of the initiators of the socialist competition for exemplary passenger service. Line 20, where V. A. Oleynikov is the party organizer, was the first in the collective to win the right to be termed exemplary.

Yesterday at the trolleybus depot No 2, a meeting was held on the occasion of turning over the jubilee vehicle by the Czech friends to the Kiev workers. The CSSR Consul General in Kiev, Oldrzih Mogelsky, and the director of the affiliate of the Czech enterprise in the city of Ostrov, Frantisek Podzemsky, who spoke at the meeting emphasized that the delivery of the 5000th trolleybus to the USSR has become still another convincing illustration of the constantly broadening, mutually-advantageous collaboration between our countries.



On behalf of the many-thousand transport workers from the city on the Dnepr, V. K. D'yakonov, the chief of the Streetcar and Trolleybus Administration of Kiev, congratulated the Czech trolleybus builders on their labor successes and the delivery of the jubilee vehicle to our country. He described the creative collaboration between the Soviet and Czech specialists. Hero of the Soviet Union, Col (Ret) M. I. Koptev, a participant in the liberation of Prague from the Nazi invaders, addressed warm words of welcome to the guests.

10272

CSO: 1821

## TRANSLATION

### IMPROVED HYDROFOIL PASSENGER VESSEL DESCRIBED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 27 Sep 79 p 4

[Unattributed article: "The 'Voskhod' Cuts the Waves"]

[Text] This attractive, high-speed hydrofoil differs greatly from the "Raketas" which have become an ordinary sight on our rivers. A new design of



the hydrofoil makes it possible for the "Voskhod" to hydroplane more rapidly and to run in seas with waves up to 1.3 meter high. The wheel house is located in the bow and the engine room is in the stern, a significant distance away from the comfortable passenger quarters. The "Voskhod" carries 71 passengers which is more than its predecessor. The range of the vessel is 500 kilometers.

10272  
CSO: 1823

## TRANSPORTATION

### RAIL CAR UNLOADING BACKLOG ON SIBERIAN RAILROADS

Moscow GUDOK in Russian 19 Oct 79 p 2

[Article by A. Kabakov, GUDOK traffic and freight department correspondent]

[Excerpt] As is known, roads of the Urals, Siberia and the Far East have now accumulated an enormous fleet of cars, which requires special, emergency measures. The expression "Eastern roads are impassable" has taken root. And a considerable share of the blame for this rests on freight workers. The excess of cars with local freight beyond the Urals is in the tens of thousands. By the end of the first third of October, for example, about 6,000 such cars were standing idle on the Sverdlovsk line, 3,420 on the South Urals, 2,238 on the West Siberian, 2,698 on the East Siberian, 2,068 on the Krasnoyarsk, 1,147 on the Transbaykal and, finally, 10,912 on the Far Eastern!

At the same time, on the Far Eastern, in September, with a necessity to free 6,400 cars daily, they unloaded less than 5,000. As a result, for the month, this trunk link was behind more than 42,000 cars in unloading, and that according to estimates made on the condition that a normal amount of local freight was present. And if the actual amount of local freight is used, the lag exceeded 50,000 cars. Some cars had been there waiting to be unloaded since February! There are 450 refrigerator sections standing on the road, and barely 10 a day are being freed....

This dismal list of facts could be continued. But we are faced with another task, that of understanding how such a situation could have arisen.

The leaders of divisions, roads, participating departments and main administrations of ministries, cite as the first reason for failure to carry out plans poor work organization on client spur tracks and in river and sea ports. And it often happens that cars stand idle, but there seems to be no one to blame. It is all a matter of being able to submit formal claims against spur track workers only if they accept cars and then delay unloading them. Therefore, many leaders of industrial enterprises have armed themselves with what is in their opinion the most profitable tactic: they do not accept cars from station workers, explaining that by a shortage of fronts, manpower or machinery. Rolling stock stands idle on station tracks, but as the saying

goes, you'll get nothing out of the enterprises. Incidentally, they have been made against clients. "Nobody's cars" -- an amazing consequence of the existing accounting system. Here is just one example. Each day over 5,000 grain cars are waiting to be unloaded, of which only 1,400 are officially recognized as being delayed through the client's fault. And the others? Waiting outside the gates.

In explaining the reasons for the dislocations in this way, the leaders of the freight main administration apparently think to remove the blame from themselves. However, it is the railroad workers themselves who accept new spur track for operation. What can they complain about when these tracks turn out not to meet modern requirements? There is a spur tracks department in the freight main administration. This subdivision is evidently also called on to direct public work aimed at accelerating loading and unloading operations on spur tracks. In particular, in order to do this, agreements and unified technological processes are to be updated once every three years and rail car idle time tightened up, naturally. This is one of the most important incentives for developing enterprise transport systems. But how are things going now? Many agreements and unified technological processes are not reviewed for years on end. During the first nine months of this year, 500 fewer agreements than planned were reviewed.

There are also serious shortcomings in freight work planning. Year after year, many recipients collect huge lines of still-loaded cars. These recipients are well-known. Still, shipment planning for them is done based on the principle "as much as before, plus a little more." The shipment planning administration of the main freight administration, headed by Comrade Zubarev, should, in this case, have acted along two lines simultaneously: first, flexible planning with precise consideration of the actual potential of the recipients, and second, simultaneously questioning the necessity for constantly and obligatorily increasing and developing that potential. Alas, they acted differently.

An example. This May, the plan was to ship 218 cars a day out to Osetrovo, but the port only unloaded 163 a day. What conclusions did the planning administration draw? In June, 245 cars a day were shipped to Osetrovo. Port workers freed 195 a day. In July, the plan was 267, and 190 were unloaded. In August, 245 and 181, respectively.... Is it surprising that average daily left-over still-unloaded cars increased month after month in Osetrovo: 318, 474.... "Planning" like this yielded similar results in Vladivostok and Varna. By not reckoning with the actual situation, they "drove" more and more cars there and, what is more, fewer and fewer of the cars which had been unloaded, not especially swiftly and left over from preceding months at that, were freed. And average daily left-overs grew: 685 cars, 1,063 cars, 1,174 cars.

...So short-sighted planning not coordinated with other ministries and departments, with the Ministry of the Maritime Fleet, for example, was the basis for these problems and this congestion. Essentially the same thing made it difficult to use the famous Leningrad method of interaction between related agencies.

The situation is also complicated by the fact that freight system workers have failed to set up proper interaction with others than clients. There is not always mutual understanding between the two most closely linked main administrations -- traffic and freight.

Freight system workers cite what they say is the fact that conveyance is a matter for traffic workers, and that we can organize unloading only for those cars which arrive. But who is to tell traffic workers where there are free fronts, what freight has priority, which enterprises can accept cars now and where, as they say, they're all sewn up as it is? In the Far East, for example, ports have long been unable to load lumber onto the ships, but carloads of lumber are sent there one after another. At the same time, recipients are ready to accept coal and petroleum products, but this freight is lost in the overall flow. It is the freight system workers and freight main administration leaders directly responsible for freeing cars who must choose and tell traffic workers what to haul on a priority basis.

The Main Freight Administration does have a department for ensuring unloading, whose work is directed by main administration deputy chief Grigorenko. The decision by which this department was returned to the TsM [not further identified], and then transferred a short time ago to the traffic main administration, was entirely correct. The freight main administration must be involved in unloading, by the very logic of the operation. Moreover, when this department was in the TsD [not further identified], the very urgent and generally disputed question of organizing the conveyance of local freight became, as they say, a family problem for traffic workers. All the justified claims associated with conveyance were "voiced" within the main administration, but all the blame was heaped on clients. An end must now be put to this, and the organizational structure provides every opportunity for doing so.

At the same time, the situation has not changed for the better. We return again to that same Far Eastern Road. Claims that local freight is conveyed poorly sound unconvincing, when it is borne in mind that each day, on the order of 7,500 cars are sent to fronts on this trunk line, while only 5,000 are freed. And the traffic workers have nothing to do with it. They have done their job with these 7,500 cars by delivering them. Next comes unloading, and that is what is lagging.

Incidentally, the unloading plan is not being carried out not just on spur tracks, but also on station tracks. There is now quite a large lag in the mechanized district loading and unloading work, on the order of 12,000 tied-up cars. And the clients cannot be blamed...

What specifically is the department for ensuring unloading doing to overcome the difficulties? The department is continuously compiling the most detailed summaries and calculating a variety of averages.... But all these figures and summaries are only to establish facts, not to manage. We need concrete steps, and not endless computations of what has already been neglected. But



only one thing, conventional limitation of loadings, can be cited as a specific step in both the department and the freight main administration as a whole. However, this is an extreme step, taken "not in the normal course of events." And it is entirely reasonable to ask if prohibiting loading will in and of itself speed up unloading. Can we count just on convention?

A responsible, state-oriented approach to the matter is incompatible with constant references to objective causes and objective difficulties. Who will argue that there are no objective difficulties in transport? They include the uneven work at maritime and river ports, chronic problems on spur tracks, and others. However, today's objective difficulties will not disappear tomorrow in and of themselves. They will have to be overcome. Is there an appropriate "strategic" plan in the freight main administration? Current interrelationships with clients, methods of planning and management -- these testify that there is thus far no such plan.

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## TRANSPORTATION

### TRACK MAINTENANCE TO PREPARE FOR WINTER

Moscow GUDOK in Russian 21 Sep 79 p 2

[Text] This past month, the railroaders of many lines have increased track maintenance work. Thanks to this, the situation has improved considerably on 19 trunk lines. The most substantial results were achieved by workers on the Southern line, where the amount of track in unsatisfactory condition was reduced by 214 km. The situation was rectified on the Transbaykal, Gor'-kiy and Kuybyshev lines.

In August alone, track district collectives did comprehensive planned preventive work on 8,000 km. A large number of new and salvageable cross ties, ballast and other materials were put down. At the same time, the systems are preparing for winter.

However, the situation continues to be disquieting on a number of lines, including the South Urals, Virgin Lands and Kemerovo, although the condition of the tracks has improved somewhat. Many kilometers are in unsatisfactory condition, many warnings have been issued which are not outlined in the train schedules. And on several trunk lines, the number of work defects has grown. In August, workers on the Sverdlovsk, East Siberian, Kemerovo and Moscow lines were especially guilty of this.

Particular attention must now be paid to the quality of the ongoing commission track inspection. It must be organized so that the inspection results enable us to work out and implement a concrete program of action which will ensure prompt preparation of the track for the winter. In view of the shortcomings of past years, the most serious attention must be paid to reinforcing the track (especially seamless track) so as to prevent breaks in rail fasteners.

Based on August results, the Krasnoyarsk, North Caucasus and Belorussian lines won the first three places. The three final places went to collectives of the Virgin Lands, Volga and Kemerovo lines.

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## TRANSPORTATION

### TRACTION EQUIPMENT WINTERIZING MAINTENANCE SHORTCOMINGS

Moscow GUDOK in Russian 19 Oct 79 p 2

[Text] The fall commission inspection is a review of the readiness of traction equipment to operate under winter conditions. This year, it was conducted in organized fashion on the Baltic, Moscow, Southwestern and Northern lines. Things were worse on the Kuybyshev, West Kazakhstan, Alma-Ata, Central Asian and Gor'kiy lines. Individual diesel engines on these lines had trouble within brief periods after passing the commission inspection.

Labor and technological discipline has dropped sharply due to poor technical servicing and maintenance of the diesel engine fleet, failures to provide depots with maintenance personnel and lack of supervision of this work on the part of road and division leaders at many depots of the Kuybyshev Road and lines in Kazakhstan. Elementary requirements regulated by the Technical Operating Rules are not being met.

Technical service and current maintenance plans are not being carried out on the Alma-Ata, West Kazakhstan, Virgin Lands, Far Eastern, South Urals, Sverdlovsk, Volga, Southeastern and West Siberian lines, although these lines are being supplied with the bulk of the technological equipment and spare parts, and individual lines are being helped to repair diesel engines.

The greatest amount of breakage and coming in for unplanned repairs has been permitted on the enumerated roads and on the Gor'kiy, Central Asia and Transbaykal. The reasons: damaged piston groups, damaged cooling systems and diesel water and oil cooling sections, damaged drive trains and traction motors. A majority of these units malfunctioned due to gross violations of the technology for repairing and servicing them.

Lines have not finished completing winter stocks of basic diesel engine technological equipment, especially the West Kazakhstan, Virgin Lands, Krasnoyarsk and Far Eastern.

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## TRANSPORTATION

### TALLIN PREPARES FOR 1980 OLYMPICS

Moscow VODNYY TRANSPORT in Russian 27 Sep 79 p 4

[Article by I. Ivanov, special correspondent: "The New Face of Tallin"]

[Text] An amazing and picturesque view opens up on Tallin from the viewing platform located on the fortress wall in the Old City. The unique roofs of one of the most beautiful cities of the country with their high smokestacks and elegant weathervanes evoke frank admiration. One of the suburbs--Pirita, which is located alongside a small river of the same name, which flows into the Gulf of Tallin, is also visible from here.

During the period of preparation of the city toward the Olympic Games, main attention was of course devoted to construction of the sailing center at Pirita, which was erected from a design of architects, Kristin and Aavo-Khinna Loover. The organizing committee of the regatta, the board of judges and the press center are located in the yacht club building. The sportsmen, of which there will be approximately 700, will be housed in eight comfortable housing quarters arranged in terraces along the shoreline. Six of the buildings already received yachtsmen during the recent competitions of the Seventh Summer Spartakiade of peoples of the USSR.

A large part of all the covered slips, in one of which there is a large hall for measuring yachts, sails and rigging, was also constructed for these competitions. The entire harbor--both the river and its sea part--were turned over for operation.

But much still remains to be done. Construction of the feeding area is continuing: a restaurant, dining hall for 400 seats and a cafe. A 25-meter swimming pool and a complex of sports halls will appear. By the end of this year an excellent four-lane motor highway will become operational.

All Tallin residents, actively included in the movement "Shock days for the Olympics," are working enthusiastically on social beginnings on various objects to organize the city, especially its central section. Therefore, one should not be amazed having seen almost the entire Old Town under construction during these days: many memorials and houses whose age numbers in the centuries are being restored.

Everyone who works a specific number of hours is awarded with special bronze, silver and gold badges. There are already unique champions among the citizens who have won several gold awards. Thus, for example, pensioner Erikh Pal'm has been awarded 13 gold badges. And more than 182,000 hours have been worked by volunteers on Olympic objects during the first six months of this year.

As was already said, the Olympics Sailing Center at Pirita was tested during the first Spartakiade.

"During the Spartakiade competitions," says the deputy chief of administration of the organizing committee of the sailing regatta Urmo Kala, "we organizers had at our disposal mainly those buildings which were necessary for testing the engineering systems. As experience showed, almost all the services are ready for holding the regatta at the highest level. And we essentially had no interruptions of any kind in the final competitions of the Spartakiade since the engineering services operated excellently."

Actually, the equipment here is the most modern. The ASU [Automatic control system] "Olimpiada-Parus" system ensured processing the results within the shortest deadlines. Because of it, for example, journalists and officials received the results of the final races even before the winners returned to their berths.

The yachtsmen lived in the same guest buildings of the Olympic Village, where the arrival of guests is expected next year. Naturally, the first clients were unable to completely enjoy the comfort and appointments of the hotels. After all, the service personnel received the buildings only 1-2 weeks prior to the arrival of the participants. But even so, the problem of housing them was solved successfully.

It is known that, besides sportsmen, 10,000 Soviet and foreign tourists will come to Tallin next summer. Hotels and the dormitories of vuzes and technical schools are being prepared for them. The large "Olimpiya" hotel is also being constructed. The new beach complex at Pirita gladly received guests and residents of Tallin this summer. Dressing rooms, rental stations, a cafe and a restaurant are available there for good relaxation. Guides-translators, public catering workers, transport workers and communications workers are undergoing special training prior to the Olympic Games.

6521

CSO: 1823



## TRANSPORTATION

### ASTRAKHAN PORT INVOLVED IN SHIPPING HARVEST

Moscow VODNIY TRANSPORT in Russian 8 Sep 79 p 1

[Article by V. Boldarev, deputy chief of Astrakhan Port: "The Hottest September"]

[Text] Astrakhan Port has been named the headquarters of grain shipments during these harvest days. We are responsible for providing rhythmic shipment of vegetables and melons. The port specialists have worked out production charts of the most productive versions of loading for shipper berths. We are rendering daily practical assistance to them and have allocated three floating cranes. At one time we repaired a crane at Biryuchka berth, located under the jurisdiction of the oblbrybolovpotrebsoyuz (Oblast union of fishermen's cooperatives). The leading specialists of the port frequently have occasion to be directly at the vegetable berths.

But, of course the main thing for us to correctly arrange the fleet supplied for the harvest of more than 40 vegetable berths located around the enormous water basin of Astrakhanskoy Oblast.

The operational working group of the oblast staff "Urozhay-79" assembles daily at the port. Together with the cargo shippers, we discuss plans of the harvest season on the main waterways. However, our business contacts are not limited to this. The permanent personal communication with the local purchasing agents and contacts with representatives of party and Soviet bodies of many rayons of the oblast permit deep evaluation of the true situation of affairs with hauling the harvest to the docks and according to this of determining beforehand and precisely the real needs for the fleet.

Beginning with the second 10 days of August, the rates of shipping products on the vegetable docks slowed down for some reason. However, in their preliminary applications the freight shippers requested a much larger fleet than was in fact required. Several motor ships and launches stood unproductively idle at that time for 2-3 days each. But the losses would have been worse if we had not managed to correct the applications, having foreseen the developing situation together with the cargo shippers, and to report to the steamship company about the changed need for ships. Part of the motor ships previously sent to Astrakhan was stopped during their approach to Volgograd Port and were switched to shipments of other cargo.

I would say that it is important to respond clearly and timely to unforeseen situations which occur during the course of shipping the harvest. And I would primarily like to give proper due to our dispatchers. Working under the supervision of the chief dispatcher Yu. Smirnov, they are applying every effort, achieving rhythm and high rates of shipment of fruits and vegetables and are attentively analyzing the course of shipment.

Comparative analysis of the situation on the docks of two rayons of Astrakhan-skaya Oblast--Yenotayevskiy and Krasnoyarskiy--was instructive. They were not randomly selected for comparison. The rates of tomato and watermelon shipments usually leave much to be desired in the first rayon and the fleet frequently stands idle for handling. They utilize the allocated transport more skillfully in Krasnoyarskiy Rayon. What is wrong? It is simply that the state and available equipment of the docks is better for the local shippers. They are not concerned in Yenotayevskiy rayon about development of dock facilities, products are shipped from an unequipped shore and sometimes the mechanization malfunctions here. In short, there is little economy in scrimping on expenditures of the necessary means and efforts and they lose a lot here--perishable products are lying on shore and the managers are paying large fines for idle times of the fleet. Here is just one example. Motor ship ST-861 stood idle in August near the dock of Sovkhoz Volzhskiy, which is in Yenotayevskiy Rayon, ten times longer than was provided by the loading norm.

More than two-thirds of the ships have been delayed at the fruit and vegetable stations above the norm since the beginning of the harvest season. The cargo shippers have paid more than 76,000 rubles in fines. The total unproductive idle time of the fleet comprised 184,000 ton-days. These losses can also be expressed differently: 13 motor ships of the ST class could have completed round-trip voyages along the Astrakhan-Moscow-Astrakhan route. It was possible to ship an additional 2,500 tons of tomatoes without recruitment of additional tonnage.

The volumes of vegetable and melon shipments were usually reduced by the end of September. Now all of September promises to be intensive. The fact is that the high floods of last spring damaged part of the plantings, which were later restored. The second unit of the harvest, as is said, is now ripening at these locations. It must also be shipped rapidly and without losses to the industrial centers of Russia.

6521

CSO: 1823

## TRANSPORTATION

### ACTIVITIES OF VARNA-IL'ICHEVSK FERRY CROSSING REPORTED

Moscow 'VODNYI TRANSPORT in Russian 8 Sep 79 p 1

[Article by V. Fedorov and Ye. Moskvina, special correspondents: "Strictly According to Schedule"]

[Text] A routine meeting of the council of directors on operation of the Il'ichevsk-Varna ferry crossing was held recently in the Bulgarian city of Ruse. It was conducted under the supervision of the chairman of the council, chief of the Black Sea Marine Shipping Company S. A. Luk'yanchenko. The council analyzed the work of the ferry crossing during the first half of 1979 and fulfillment by the parties of the requirements in part of the technical and commercial state of the rail cars placed on shipment and proposals to change the rules of formulation of shipping and transfer documents.

Great attention was devoted at the meeting of the council to further development of the international complex socialist competition between the ferry vessels and the shore enterprises--participants of international ferry service and to determining the forms of incentives to the winners.

Only eight months have passed since the beginning of operation of the first unit of the crossing. The period of assimilation of this unique international transport complex is essentially under way and more than 1.5 million tons of national economic goods have already been hauled over the bridge of friendship. Four ferry vessels have completed more than 400 voyages in both directions and have transported 35,000 rail cars. By improving the administrative system and organizing the socialist competition more widely, the Soviet and Bulgarian transport workers are waging a persistent struggle for the most rapid assimilation of the design capacity of the crossing.

Il'ichevsk

They said that the Bulgarian ferry "Geroi Sevastopolya" would be at the dock at 12:00. It arrived one-half hour earlier. The entire blue face of Sukhoy Liman is spread before one's eyes from the motor highway which links Il'ichevsk to Odessa where it branches off down toward the shore ferry complex. But the ships are never visible.

"Don't worry," the chief of the complex Anatoliy Dmitriyevich Voynovskiy assured us. "It will arrive on schedule."

Intensive work on the crossing is proceeding not only when rail cars are being loaded or unloaded. A clear labor rhythm is felt here constantly. Not only the workers of the Il'ichevsk-Ferry Station participate in the production complex of getting together the freight and receiving and shipping of rail cars, but also the collectives of the Odessa-Marshalling Locomotive Depot and the Odessa-First Gate Rail Car Depot. All operations are calculated by minutes. The Il'ichevsk transport workers are doing everything possible to make the labor of their Bulgarian colleagues more efficient.

"And how can we do otherwise?" says Anatoliy Dmitriyevich. "We are working in close cooperation, we are competing and this means that we help each other." In the complex competition, an important role belongs to the unified dispatcher shifts. There are four of these shifts at Il'ichevsk, 19 persons in each one. And the railroad workers and port workers involved in them work in close interaction. The relationship between all sections of the transport process is reliably provided with the most modern means: radio telephone, teletypes and so on. Main information is processed on a computer.

The results of the competition of the unified shifts are summarized monthly at joint meetings of trade-union committees of the ferry region of the Il'ichevsk-Ferry Port and Station. The challenge banner and a monetary prize are awarded to the winning shift.

"The shift now working," says A. D. Voynovskiy, "emerges as the winner more frequently than the others. The rayon dispatcher M. Shcherbakov, the shift station dispatcher S. Matskevich and rayon railroad dispatcher M. Safronova supervise it."

One of the main criteria in evaluating the work of the shifts is strict adherence to the schedule, which includes loading rail cars on one shore, unloading them on the other and the time that the ships are under way. A total of 72 hours is now planned for these operations.

Fulfillment of the schedule was not immediately possible. It was necessary in one way or another to overcome many organizational and production difficulties. The collectives are now faced with the task of reducing a round-trip voyage to 60 hours. The task is difficult, but fulfillable, as will be seen in the near future.

And the handsome ferry "Geroi Sevastopolya" became confirmation of this. It docked exactly at 12:00.

Varna

And at the same time the Soviet ferry "Geroi Plevny," which Captain Ivan Ivanovich Koval' piloted here was tying up on the Bulgarian shore to the

dock of the ferry complex at Varna. True, he arrived somewhat underloaded. But, as was learned from a conversation with the first mate of the motor ship Nikolay Ivanovich Moroz, there were good reasons for this. Generally the crew had not disrupted the schedule once during their navigation season, systematically fulfilling the plan and their own high socialist pledges.

A strong collective capable of solving the most complex production tasks has been organized on the ferry.

N. Moroz named those who are among the leaders of the competition, being themselves models of a remarkable attitude toward the matter.

This is Yevgeniy Vladimirovich Slivanchenko--the fourth engineer. He began as a senior fitter on the motor ship "Ignatiy Sergeyev," and now, as his comrades are proud of saying on the ferry, "he is worth three engineers."

This is Ivan Levont'yevich Bondarets--the senior fitter. Since his acceptance, he has been a member of the ship trade-union committee on the ferry "Geroi Plevny." He is a specialist of the highest qualification who is capable of doing any work on machines.

The first mate seaman first class Nikolay Ivanovich Bogalyub, senior helmsman Vladimir Ivanovich Kustov, second engineer Viktor Fedorovich Mitin, electrician Stanislav Stepanovich Lominkin and many others have been awarded with just as many latter characteristics.

A little earlier we were visiting the complex itself and became acquainted with the work of the marine operations service (this is what we call it), headed by Stefan Zekhrev. We saw very many good things. But among the numerous conversations and our own observations we concluded that much still remains to be done to bring the ferry crossing complex here on the Bulgarian shore up to design standards. This is true of both the production activity of the complex and of solution of a number of organizational problems.

Let us cite only a few "bottlenecks," which we feel must be "expanded" and the sooner the better.

Delays of rail cars at the railroad stations by the cargo consignees are still too high. True, they are being reduced from month to month, but they are still far from the planned normal deadlines. This happens because the ships are leaving with short cargo or are standing idle while waiting for rail cars.

There is not enough locomotive traction. It is extremely necessary to deliver additional locomotives to the one existing diesel locomotive for wide gauge.

The time has come, although much has been done, to think seriously about bringing order to the operation of the cargo transloading point from the



wide-gauge rail cars to narrow-gauge cars--both from flatcars and from boxcars. For example, it has been proposed that a number of types of cargo be transferred by using gantry cranes available at the terminal from a wide-gauge to narrow-gauge flatcar without moving the bogies. The time saving from this innovative proposal promises to be very impressive.

Delivery of apparatus for duplication of documents for the Varna-Ferry Complex must be accelerated and teletype communications must be utilized more fully.

One should think about expansion and deepening of the channel. Problems related to construction of radar stations and navigational aides (beacons and buoys) must be solved to avoid prolonged idle times of ships related to meteorological and navigation conditions.

Briefly speaking, both the shore and the sea (the ferries) should operate with the clarity of a clock mechanism, strictly according to schedule.

6521

CSO: 1823

## NEW RESCUE CUTTER 'PEGAS' IN SERVICE

Moscow PRAVDA in Russian 10 Oct 79 p 6

[Article by A. Androshin: "'First-Aid' Speeding Across the Sea"]

[Text] The all-weather rescue cutter "Pegas" has begun operation in the Black Sea. It is being used to render assistance to the passengers and crews of ships in distress.

SOS is the signal of distress. If it is heard over the air then an emergency exists and people's lives are in danger. And those hearing this call hurry to the rescue. Such is the law of the sea...

But those who go to the rescue are frequently plagued with obstacles. One ship cannot cope with a storm, another, even with its engines at full throttle, does not reach the scene of the emergency soon enough. And often the success or failure of a rescue mission is decided by minutes.

Of course specialists at the Leningrad Central Planning-Design Bureau understood this when they set to work creating this water-born "first-aid" unit. Thus, they developed the "Tegas" as a fast, maneuverable and unsinkable vessel.

It is an all-weather boat as well. The description of the cutter reads: "Capable of rescue operations under any conditions, including a force-twelve gale. It has no seagoing restrictions..." This is a fact, even though the "Pegas" is smaller than other ships in its class. Its stability is greater than that of an ocean-going freighter which operates in any weather. The cutter's steel hull is designed so as to negotiate thin, cracked ice and slush ice. On its way to an accident the 3 engines of the "Pegas" can, if necessary, provide a speed of 18 knots. It also has modern navigational equipment, special radar units and powerful searchlights....

The cutter can approach a burning ship without caution: fire is no threat to it. The water-shielding system makes the hull of the "Pegas" impenetrable. When it is turned on there is a real downpour on the cutter. On

board there is an abundance of rescue gear: safety nets, rafts, multi-length boarding ladders and special nets.

The cutter has two steering positions. One is located, as it usually is, in the pilot-house. The other is a remote unit. It is situated on the upper after bridge and permits the captain to keep a better watch over the area of operations.

The crew of the "Pegas", three in all, has responsibility for both the normal operational shipboard duties and for attending to those who have been rescued. Two cabins resembling those on airplanes are provided for the rescued people: there are facilities for 40 passengers.

In summing up the design features of the new cutter, we just want to add that it has double sides and double hulls. In other words it means that the "Pegas" is wearing two metal "shirts" and as a consequence is unsinkable.

The "Pegas" was built at the Astrakhan' Ship Repair Yard inani 10th Anniversary of the October Revolution. It was launched there and then moved to Odessa where it underwent its first operational test in a rescue unit of the Black Sea Steamship Company.

Where is the "Pegas" now? At the Black Sea Steamship Company we found out that the cutter was taking part in the raising of the Bulgarian tanker "Lon", which went down in a mishap several years ago not far from Odessa. A captain has been named for the cutter. He is the experienced shipmaster-rescue-worker P. Kalinkin. After completion of its work in Odessa he will take the "Pegas" to Novorossiysk -- its port of registration.

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## TRANSPORTATION

### BRIEFS

TU-144 IMPROVEMENTS--From press agency reports we learn that a new version of the Soviet supersonic aircraft, the TU-144D, has been prepared. The TU-144D has an increased range and engines with very low fuel consumption. [Text] [Warsaw SKRZYDLATA POLSKA in Polish No 40, 7 Oct 79 p 16]

NEW PORT ON OB'--Construction of the first section of the Nizhnevartovsk river port has been completed. The mooring wall, crane rails and associated buildings have been turned over for operation. The new Ob' port will be able to handle approximately 2.5 million tons of cargo annually. Two ports are now in operation in Tyumenskaya Oblast--Tobol'skiy and Surgutskiy. In the next five-year plan when the Nizhnevartovskiy port comes into full operation, the Ob' artery will become the most important transportation artery for developing the West Siberian territorial-production complex. [Text] [Moscow GUDOK in Russian 11 Oct 79 p 1] 6754

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